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May 13, 1980

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT consult the notice entitled "update of information concerning the Patent Cooperation Treaty" appearing in the OFFICIAL GAZETTE of February 12, 1980.

Note that since August 1, 1979 certain fees for the processing of International Applications have been increased. The current schedule of fees is as follows:

Transmittal fee	$35.00
Search fee	300.00
Basic fee (first 30 pages)	190.00
Basic fee supplement (each sheet over 30)	3.50
Designation fee	45.00

SIDNEY A. DIAMOND,
Jan. 28, 1980. *Commissioner of Patents and Trademarks.*

Rules Service Company Address Change

The Patent and Trademark Office has been notified of a change in the address and telephone number of the Rules Service Company which publishes a looseleaf Rules of Practice in Patent and Trademark Cases with a revision service. The new address and telephone numbers are:

Rules Service Company
4341 Montgomery Avenue
Bethesda, Maryland 20014
(301) 656-4660

SIDNEY A. DIAMOND,
Date: Apr. 7, 1980. *Commissioner of Patents and Trademarks.*

Patent Suits

Notices under 35 USC 290; Patent Act of 1952

3,041,322, Loctite Corporation, ANAEROBIC CURING COMPOSITIONS CONTAINING ACRYLIC ACID DIESTERS; **3,046,262**, same, ACCELERATED ANAEROBIC CURING COMPOSITIONS; **3,218,305**, same, ACCELERATED ANAEROBIC COMPOSITIONS AND METHOD OF USING SAME, filed June 24, 1977, D.C., N.D. Ill. (Chicago), Doc. 77c2278, *Loctite Corporation* v. *Fel-Pro, Inc.* Cause is dismissed pursuant to memorandum opinion and order entered on Mar. 7, 1980.

3,046,262. (See 3,041,322.)

3,055,904, Ciba Geigy Chemical Corporation, NEW ISOINDOLINE DERIVATIVES, filed May 24, 1979, D.C.N.J. (Newark), Doc. 79-1582, *USV Laboratories* v. *Pharmadyne Laboratories, Inc.* Amendment to final judgment in favor of plaintiff filed Mar. 17, 1980.

3,065,530, Swanson-Erie Corp., MULTIPLE MOTION PROCESSING MACHINE; **3,231,968**, same, AUTOMATIC ASSEMBLY CENTER, filed Mar. 7, 1980, D.C., W.D. Pa. (Erie), Doc. 80-39 K ERIE, *Swanson-Erie Corporation* v. *Assembly Machines, Inc.*

3,097,614, William J. Duncan, TABLE EXTENSION SLIDE MECHANISM, filed July 26, 1978, D.C., M.D.N.C. (Greensboro), Doc. C-78-330-WS, *Acme Metal Slide, Inc.* v. *Sun Metal Products, Inc.* Action dismissed with prejudice pursuant to stipulation of dismissal between parties filed on Mar. 7, 1980.

3,129,748, Harold E. Varvel, OIL BURNER; **3,741,709**, Loris D. Clark, SOLID STATE SAFETY CONTROL FOR FUEL BURNING APPARATUS; **4,061,238**, Briggs et al., PORTABLE HEATER, filed Dec. 10, 1979, D.C., E.D. Mich. (Detroit), Doc. 79-74633, *Kochring Company* v. *Ex-Cell-O-Corp. and McCord Corporation.*

3,164,855, Howard and Kaplan, A METHOD OF MAKING BREAST PADS, CUPS AND FRONTS, filed May 17, 1979, D.C. Conn. (New Haven), Doc. N 79-136, *International Molders, Inc.* v. *Bontec Corp. and Donald Gurry.* Consent decree entered Feb. 27, 1980.

3,184,355, J. K. Brown, METHOD OF MAKING A PRINTER'S ROLLER, filed Dec. 12, 1977, D.C. Del. (Wilmington), Doc. 77-472, *Samuel Bingham Company* v. *Rodel, Inc.* Order vacating final consent judgment of Feb. 7, 1980 filed Mar. 3, 1980.

3,218,305. (See 3,041,322.)

3,231,968. (See 3,065,530.)

3,360,446, M & T Chemicals, Inc., ELECTRODEPOSITING A TIN-BISMUTH ALLOY AND ADDITIVES THEREFOR; **3,522,155**, same, METHOD OF ELECTRODEPOSITING A TIN-BISMUTH ALLOY AND COMPOSITIONS THEREFOR, filed Nov. 13, 1979, D.C., N.D. Ala. (Birmingham), Doc. CA 79-G-1276-S, *M & T Chemicals, Inc.* v. *Vulcan Materials Company.*

3,367,320, Jenn-Air Corporation, SELF-VENTILATING COOKING RANGE, filed Mar. 13, 1980, D.C. Del. (Wilmington), Doc. 80-122, *Jenn-Air Corporation* v. *Modern Maid Co.*

3,375,976, Inject-O-Meter Manufacturing Company, Inc., FERTILIZER APPLICATION PROCESS, filed Feb. 29, 1980, D.C., E.D. Wash. (Spokane), Doc. C-80-82, *Inject-O-Meter Mfg. Co., Inc.* v. *Agri-Systems Division of Min-Mas International, Inc.*

3,380,097, E Z Paintr Corporation, EXTENSION HANDLE FOR PAINT ROLLER, filed July 25, 1979, D.C., N.D. Ill. (Chicago), Doc. 79c3071, *E Z Paintr Corporation* v. *Lloyds Paint 'N Paper, Inc.* Consent judgment entered in favor of plaintiff and against defendant dated Jan. 16, 1980.

3,391,654, ACF Industries, Inc., RAILWAY CAR, filed Feb. 26, 1980, D.C. Del. (Wilmington), Doc. 80-94, *ACF Industries, Inc.* v. *MacLean-Fogg Co.*

3,403,868, W. P. Lear, MAGNETIC TAPE CARTRIDGE SYSTEM, filed Mar. 25, 1977, D.C. Mass. (Boston), Doc. 76-865-T, *Entec Plastics Engineering Corp.* v. *Gates Rubber Company.* Judgment entered Jan. 28, 1980.

3,409,579, Ashland Oil & Refining Company, FOUNDRY BINDER COMPOSITION COMPRISING BENZYLIC ETHER RESIN, POLYISOCYANATE & TERTIARY AMINE, filed Feb. 21, 1980, D.C., N.D. Ind. (South Bend), Doc. S80-0046, *Ashland Oil, Inc.* v. *Niles Chemical Paint Co., Inc.*

3,464,414, The Upjohn Company, MIXING VIAL CONSTRUCTION, filed July 12, 1978, D.C., N.D. Ill. (Chicago), Doc. 78c2776, *The Upjohn Company* v. *Abbott Laboratories.* Stipulated order of dismissal dated Feb. 21, 1980.

3,522,155. (See 3,360,446.)

3,539,845, Georges Stcherbatcheff, MOTOR WHOSE MAGNETIC CIRCUIT COMPRISES A THIN LAYER OF HARD MAGNETIC MATERIAL, filed Oct. 26, 1978, D.C., S.D.N.Y., Doc. 78 C-5114 GLG, *Portescap* v. *Bulova Watch Company, Inc.* Action by plaintiff against defendant is hereby discontinued and dismissed pursuant to stipulation filed Mar. 10, 1980.

3,552,469, B & J Manufacturing Company, TIRE BEAD SEATER; **3,675,705**, same, TIRE BEAD SEATING AND INFLATION APPARATUS; **3,805,871**, same, TIRE MOUNTING, BEAD SEATING AND INFLATION APPARATUS AND METHOD OF USE, filed Feb. 6, 1975, D.C., N.D. Ill. (Chicago), Doc. 75c401, *B & J Manufacturing Company* v. *FMC Corporation.* Consent judgment entered Sept. 10, 1979.

3,613,264, Motionetics, Inc., WAVE CELL, filed June 19, 1978, D.C., N.D.N.Y. (Utica), Doc. 78-CV-282, *Motionetics, Incorporated* v. *Stephen Laffer, doing business as Boat Works.* Order of dismissal filed Jan. 8, 1980.

3,613,353, Bruce A Kock, WATCH; **3,685,282**, same, WATCH ESCAPEMENT MECHANISM, filed June 8, 1978, D.C., N.D. Calif. (San Francisco), Doc. C-78-1254-SAW, *Bruce A. Kock* v. *Quaker Oats Co.* Order and final judgment filed Feb. 6, 1980.

3,675,705. (See 3,552,469.)

3,685,282. (See 3,613,353.)

3,741,709. (See 3,129,748.)

3,786,734, Martin Long, UNDERWATER ELECTRONIC FLASH ACTUATOR, filed Mar. 11, 1980, D.C., N.D. Calif. (San Francisco), Doc. C-80-741 RFP, *Martin Long* v. *O. H. Brigham.*

3,805,871. (See 3,552,469.)

3,806,312, McMaster and Nitschke, ROLLER HEARTH FURNACE; **3,936,291,** Harold A. McMaster, GLASS SHEET TEMPERING BLASTHEAD, filed Sept. 14, 1979, D.C., E.D. Mich. (Flint), Doc. 79–40214, *Glasstech, Inc.* v. *Double Seal Glass Company Inc.* Voluntary dismissal filed by plaintiff on Feb. 4, 1980.

3,807,069, Robert Daley, INDEXING DEVICE, filed May 16, 1979, U.S. Court of Appeals (First Circuit, Boston), Doc. 79–1195, *Robert Daley et al.* v. *Grafton Printing Co. Inc.* The judgment of the District Court is affirmed. Dated Mar. 13, 1980.

3,809,397, Bryan J. Grunewald, APPARATUS FOR DEVELOPING QUICKNESS IN SWINGING OF A BASEBALL BAT, filed Feb. 4, 1980, Bankruptcy Court, S.D. Calif. (San Diego), Doc. C–80–0022–P, *Bryan J. Grunewald* v. *Power Swing Partners, doing business as Power Swing.*

3,936,291. (See 3,806,312.)

3,937,939, Marvin A. Frenkel, SINGLE-HAND DIGITAL CALCULATOR, filed Feb. 29, 1980, D.C., E.D. Mich. (Detroit), Doc. 80–70898, *Marvin A. Frenkel* v. *Chris-Craft Corporation.*

3,995,102, Raceway Components, Inc., INSERT DEVICE FOR CABLES, filed Mar. 13, 1980, D.C. Conn. (New Haven), Doc. N–80–86, *Raceway Components, Inc.* v. *Harvey Hubbell, Inc.*

4,011,630, Edward Ochylski, HOG SKINNING METHOD AND APPARATUS, filed June 22, 1979, D.C., E.D. Mo. (St. Louis), Doc. 79–770C (A), *Edward Ochylski* v. *St. Louis Meats, Incorporated.* Final decision filed Mar. 11, 1980.

4,081,288. (See 3,129,748.)

4,084,317, Matsuzaka Iron Works, Inc., SHEARING TOOL FOR SYNTHETIC RESIN TUBES; **D. 252,666,** same, VINYL PIPE CUTTER, filed Mar. 6, 1980, D.C., C.D. Calif. (Los Angeles), Doc. 80–00856 TJH, *Matsuzaka Iron Works, Inc.* v. *William Wallace Taylor, doing business as Continental International.*

4,106,878, Paul H. Jones, FIRE-RATED CEILINGS GRID CROSS JOINT, filed Feb. 25, 1980, D.C., E.D. Pa. (Philadelphia), Doc. 80–0791, *Edgar J. and Charmaine M. Sturmann* v. *NRM Investment Company.*

D. 247,735, Chicago Cutlery Consumer Products, Inc., HOLDER FOR CUTLERY AND SHARPENING STEEL, filed Mar. 10, 1980, D.C. Minn. (St. Paul), Doc. 3–80–180, *Chicago Cutlery Consumer Products, Inc.* v. *Bordein Corporation and Tommer Division of Bordein Corporation.*

D. 252,666. (See 4,084,317.)

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,379,756, Re. S.N. 092,306, Filed Nov. 8, 1979, Cl. 562/582, MANUFACTURE OF MALIC ACID, Carl R. Ahlgren, Owner of Record: *Allied Chemical Corporation, New York, N.Y.,* Attorney or Agent: Jay P. Friedenson, et al., Ex. Gp.: 126

3,542,629, Re. S.N. 115,117, Filed Jan. 24, 1980, Cl. 156/556, METHOD AND APPARATUS FOR PRODUCING AND TRANSPORTING SINGLE AND MULTILAYER CHIPBOARDS, Wolfgang Burkner, Owner of Record: *Carl Schenck Maschinenfabrik GmbH, Darmstadt, West Germany,* Attorney or Agent: Robert B. Russell, Ex. Gp.: 161

3,552,543, Re. S.N. 124,041, Filed Feb. 25, 1980, Cl. 198/219, ACCUMULATING LIFT AND CARRY CONVEYOR, Peter J. Manetta, Owner of Record: *MGA Inc., Warren, Mich.,* Attorney or Agent: Allen M. Krass, et al., Ex. Gp.: 313

3,584,398, Re. S.N. 111,130, Filed Jan. 10, 1980, Cl. 35/31, TEACHING DEVICE HAVING MEANS PRODUCING A SELF-GENERATED PROGRAM, Jerome C. Meyer, et al., Owner of Record: *Eric F. Burtis, Redwood City, Calif.,* Attorney or Agent: Francis A. Utecht, et al., Ex. Gp.: 334

3,732,516, Re. S.N. 105,793, Filed Mar. 6, 1980, Cl. 337/194, COMPACT CARTRIDGE-TYPE FUSE HOLDER, Jordan F. Puetz, Owner of Record: *Square D Company, Park Ridge, Ill.,* Attorney or Agent: William H. Schmeling, Ex. Gp.: 212

3,897,265, Re. S.N. 123,600, Filed Feb. 22, 1980, Cl. 429/35, GAS DEPOLARIZED ELECTROCHEMICAL CELLS AND METHOD OF ASSEMBLY, Arthur M. Jaggard, Owner of Record: *Gould Inc., St. Paul, Minn.,* Attorney or Agent: Augustus J. Hipp, Ex. Gp.: 114

4,018,929, Re. S.N. 119,601, Filed Feb. 7, 1980, Cl. 424/263, 3-LOWER ALKYLCARBANYLSUL-FONAMIDO-4-PHENYLAMINOPYRIDINES, N-OXIDES, DERIVATIVES THEREOF AND PHARMACEUTICAL COMPOSITIONS CONTAINING SAME, Jacques E. DeLarge, et al., Owner of Record: *A. Christiaens Societe Anonyme, Brussels, Belgium,* Attorney or Agent: Richard C. Sughrue, et al., Ex. Gp.: 125

4,028,114, Re. S.N. 124,210, Filed Feb. 25, 1980, Cl. 430/289, PHOTOCHEMICAL SYSTEM FOR COATING THE LUMINESCENT SCREEN OF A COLOR TELEVISION PICTURE TUBE, Uwe Viohl, Owner of Record: *International Standard Electric Corporation, New York, N.Y.,* Attorney or Agent: Walter J. Baum, et al., Ex. Gp.: 166

4,042,176, Re. S.N. 065,567, Filed Aug. 10, 1979, Cl. 241/24, DEBONING APPARATUS AND METHOD, Nicholas R. Beck, et al., Owner of Record: *The Kartridge Pak Co., Davenport, Iowa,* Attorney or Agent: Fred S. Lockwood, et al., Ex. Gp.: 322

4,073,546, Re. S.N. 121,506, Filed Feb. 14, 1980, Cl. 303/115, ANTI-SKID VEHICLE BRAKING SYSTEM, John P. Bayliss, Owner of Record: *Girling Limited, Birmingham, England,* Attorney or Agent: Samuel Scrivener Jr., et al., Ex. Gp.: 315

4,075,056, Re. S.N. 092,734, Filed Nov. 9, 1979, Cl. 162/305, PRESS SECTION STRUCTURE, Donald A. Ely, et al., Owner of Record: *Beloit Corporation, Beloit, Wis.,* Attorney or Agent: James Van Santen, et al., Ex. Gp.: 173

4,075,605, Re. S.N. 122,799, Filed Feb. 19, 1980, Cl. 340/146.3 AC, CHARACTER RECOGNITION UNIT, Larry L. Hilley, et al., Owner of Record: *Recognition Equipment Incorporated, Irving, Tex.,* Attorney or Agent: John E. Vandigriff, Ex. Gp.: 237

4,076,350, Re. S.N. 124,336, Filed Feb. 25, 1980, Cl. 312/242, UNIVERSAL RECESSED WALL CABINET, Norman Benjamin Crist, Owner of Record: *Inventor,* Attorney or Agent: Robert W. Beach, et al., Ex. Gp.: 355

4,082,436, Re. S.N. 063,421, Filed Aug. 3, 1979, Cl. 352/72, MOTION PICTURE CAMERA, Robert E. Gottschalk, Owner of Record: *Panavision, Incorporated, Tarzana, Calif.,* Attorney or Agent: John B. Young, et al., Ex. Gp.: 211

4,103,554, Re. S.N. 121,907, Filed Feb. 15, 1980, Cl. 73/573, METHOD AND A DEVICE FOR ASCERTAINING THE DEGREE OF COMPACTION OF A BED OF MATERIAL WITH A VIBRATORY COMPACTING DEVICE, Heinz F. Thurner, Owner of Record: *Inventor,* Attorney or Agent: Terrell C. Birch, Ex. Gp.: 244

4,125,902, Re. S.N. 121,748, Filed Feb. 15, 1980, Cl. 2/74, FITS ALL SIZES WRAP-AROUND GARMENT, Michael B. Frank, Owner of Record: *Uniforms To You & Co., Chicago, Ill.,* Attorney or Agent: Fred S. Lockwood, et al., Ex. Gp.: 353

4,133,235, Re. S.N. 122,495, Filed Feb. 19, 1980, Cl. 83/74, CLOSED LOOP APPARATUS FOR CUTTING SHEET MATERIAL, Heinz J. Gerber, Owner of Record: *Gerber Garment Technology, Inc., East Hartford, Conn.,* Attorney or Agent: John C. Linderman, Ex. Gp.: 323

4,144,935, Re. S.N. 118,957, Filed Feb. 6, 1980, Cl. 166/248, APPARATUS AND METHOD FOR IN SITU HEAT PROCESSING OF HYDROCARBONACEOUS FORMATIONS, Jack Bridges, et al., Owner of Record: *I.I.T. Research Institute, Chicago, Ill.,* Attorney or Agent: John H. Tregoning, et al., Ex. Gp.: 354

4,149,711, Re. S.N. 124,779, Filed Feb. 26, 1980, Cl. 270/57, PERSONALIZED ON-LINE PRINTING AND INSERTING MAGAZINE BINDING MACHINE, Dale H. Jackson, Owner of Record: *Harris Corporation, Cleveland, Ohio,* Attorney or Agent: Thomas L. Tarolli, et al., Ex. Gp.: 337

4,175,937, Re. S.N. 111,773, Filed Jan. 14, 1980, Cl. 55/419, GAS-CONTAMINANT SEPARATOR, Steven G. Brandau, et al., Owner of Record: *Deere & Company, Moline, Ill.,* Attorney or Agent: H. Vincent Harsha, et al., Ex. Gp.: 177

4,177,176, Re. S.N. 122,919, Filed Feb. 20, 1980, Cl. 260/29.2 M, TREATMENT OF FIBRES, Peter M. Burrill, et al., Owner of Record: *Dow Corning Limited, London, England,* Attorney or Agent: Robert F. Fleming, Jr., Ex. Gp.: 142

4,182,552, Re. S.N. 124,722, Filed Feb. 26, 1980, Cl. 350/303, SIDE VIEW MIRROR EMPLOYING PRISM FOR BLIND SPOT CORRECTION, William Feinbloom, Owner of Record: *Inventor,* Attorney or Agent: Arthur L. Plevy, et al., Ex. Gp.: 257

PATENT NOTICES

Certificates of Correction for the Week of May 13, 1980

Re. 29,065	4,144,877	4,178,543	4,182,974
Re. 29,916	4,153,196	4,178,683	4,183,423
3,666,079	4,156,789	4,179,438	4,183,763
3,873,196	4,160,344	4,179,561	4,183,780
3,972,034	4,160,560	4,179,603	4,183,973
4,016,000	4,162,792	4,179,859	4,184,008
4,089,837	4,170,379	4,180,449	4,184,201
4,102,979	4,170,739	4,180,456	4,184,529
4,103,049	4,170,883	4,180,470	4,184,684
4,106,261	4,171,216	4,180,706	4,184,727
4,107,413	4,171,217	4,180,877	4,184,877
4,107,414	4,173,879	4,181,585	4,185,489
4,109,013	4,174,500	4,181,779	4,185,870
4,112,331	4,175,368	4,182,103	4,185,944
4,117,544	4,175,545	4,182,117	4,186,034
4,127,232	4,176,120	4,182,197	4,186,217
4,128,168	4,177,066	4,182,229	4,186,359
4,137,214	4,177,084	4,182,366	4,187,930
4,138,165	4,177,208	4,182,703	4,188,122
4,142,738	4,177,825	4,182,719	4,188,832
4,143,541	4,178,205	4,182,761	4,190,105
4,144,205	4,178,391	4,182,849	

Disclaimers

4,046,719.—*Robert J. Stanaback*, Gladstone, N.J. and *Michael J. Reale*, Southeast, N.Y. FLAME-RETARDANT RESINOUS COMPOSITIONS CONTAINING TRIHALONEOPENTYL HALOALKYL PHOSPHATES. Patent dated Sept. 6, 1977. Disclaimer filed Mar. 25, 1980, by the assignee, *Tenneco Chemicals, Inc.*

Hereby enters this disclaimer to claims 1, 2, 4, 5, 7, 8, 9, 10, 11, 12, 13, 14 and 17 of said patent.

4,117,260.—*Frederic Nash Wilkenloh*, Conover, N.C. COAXIAL DROP WIRE. Patent dated Sept. 26, 1978. Disclaimer filed Mar. 17, 1980, by the assignee, *Comm/Scope Company.*

Hereby enters this disclaimer to the entire remaining term of said patent.

Erratum

All reference to Patent No. 4,197,317 to David J. Jollow of South Carolina for INHIBITING PLATELET AGGREGATION WITH SUBSTITUTED ACETANILIDES appearing in the OFFICIAL GAZETTE of Apr. 8, 1980 should be deleted since no patent was granted.

January-March 1980 Classification Orders

The reclassifications covered by the following classification changes became effective between January and March 1980.

Classification Order 713, effective January 24, 1980:	Class	Subclasses
Abolished	D48	ALL.
	D73	ALL.
Established	D24	68.
	(New) D26	1-156.
	D28	8.1; 8.2
Title Changes	D10	46; 111.
	D16	42.
	D18	6.
	D20	10.

Classification Order 714, effective January 28, 1980:	Class	Subclasses
Abolished	178	50-51.
	179	2.5; 15.
Established	179	2.51.
	(New) 370	1-119.

Classification Order 715, effective January 28, 1980:	Class	Subclasses
Abolished	178	66-68; 69.1; 88.
	235	301-309; 312.
	250	199.
	325	ALL.
	340	146.1.
	343	175-181; 200-208; 225-228.
	358	191-195.
Established	178	66.1; 66.2; 67.1; 116-120.
	340	694-696.
	358	191.1; 192.1; 193.1; 194.1; 195.1
	(New) 371	1-72.
	(New) 375	1-121.
	(New) 455	1-355; 600-620.

Classification Order 716, effective February 19, 1980.	Class	Subclasses
Abolished	273	95-106.5.
Established	273	310-428.

Classification Order 717, effective February 19, 1980:	Class	Subclasses
Abolished	358	128.
Established	358	128.5; 128.6.

Classification Order 718, effective February 26, 1980:	Class	Subclasses
Abolished	60	39.65-39.74.
Established	60	39.83; 722-760.
Position Change	60	39.23.
Title Change	60	39.23.

Classification Order 719, effective February 26, 1980:	Class	Subclasses
Abolished	428	423-425.
Established	428	422.8; 423.1; 423.3-423.5; 423.7; 423.9; 424.2; 424.4; 424.6-424.8; 425.1; 425.3; 425.5; 425.6; 425.8; 425.9.

Classification Order 720, effective February 26, 1980:	Class	Subclasses
Abolished	427	207; 248; 372; 374; 376; 383; 385; 388; 390; 398; 407; 419; 420; 434.
Established	427	207.1; 208.2; 208.4; 208.6; 208.8; 248.1; 255.1-255.7; 372.2; 374.1-374.7; 376.1-376.8; 383.1; 383.3; 383.5; 389.7; 389.9.

Classification Order 720, effective February 26, 1980:	Class	Subclasses
Established	427	385.5; 388.1-388.5; 389.7-389.9 393.1-393.6; 397.7; 397.8 398.1-398.5; 407.1-407.3; 412.1-412.5; 419.1-419.8; 430.1; 434.2-434.7; 443.1; 443.2.

Classification Order 721, effective March 3, 1980:	Class	Subclasses
Established	128	Cross-Reference Art Collection. 910.

Classification Order 722, effective March 25, 1980:	Class	Subclasses
Abolished	29	426; 427; 624-630.
Established	29	426.1-426.6; 825-885.

Classification Order 723, effective March 26, 1980:	Class	Subclasses
Abolished	244	83-86.
Established	244	220-237.

Classification Order 724, effective March 26, 1980:	Class	Subclasses
Abolished	186	1.
Established	186	35-69.
Indent Changes	186	2-34.
Title Changes	186	

Classification Order 725, effective March 28, 1980:	Class	Subclasses
Abolished	58	ALL.
	324	181-191.
Established	(New) 368	1-327.

ALFRED C. MARMOR,
Administrator for Documentation,
April 15, 1980

Set XIV of Addenda to the Classification Definitions

The definitions of the classes listed below were modified by addenda as part of Classification Orders issued between October and December 31, 1979. All of these addenda have been consolidated into Set XIV of "Addenda to the Classification Definitions."

Class	Class	Class	Class	Class	Class
2	64	136	222	315	362
3	65	137	224	316	364
5	68	140	228	320	365
8	73	144	230	324	403
9	74	145	244	325	406
15	81	156	248	328	407
17	83	162	249	330	408
23	96	164	250	333	410
24	98	166	252	335	414
29	100	172	264	339	422
30	101	173	269	340	424
32	105	175	271	343	425
34	106	180	274	346	427
35	114	181	279	350	428
38	116	188	280	352	429
43	118	191	296	354	430
49	119	198	299	355	433
51	128	204	307	356	585
52	131	206	310	358	
60	132	219	312	360	
62	134	220	313	361	

The following newly established classes issued between October and December 1979: Classes D26, 368, 370, 371, 375, and 455.

ALFRED C. MARMOR,
Administrator for Documentation,
April 15, 1980.

National Technical Information Service

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Requests for information on the licensing of particular inventions should be directed to the addresses cited for the agency-sponsor.

DOUGLAS J. CAMPION,
Program Coordinator,
Office of Government Inventions and Patents,
National Technical Information Service,
U.S. Department of Commerce.

U.S. DEPARTMENT OF ENERGY
Assistant General Counsel for Patents
Washington, D.C. 20545

Patent application 857,717. Alcohols as Hydrogen-Donor Solvents for Treatment of Coal. Filed Dec. 5, 1977.

Patent application 858,221. Regeneration of Lime from Sulfates for Fluidized-Bed Combustion. Filed Dec. 7, 1977.

Patent application 863,765. Hydrogenation Process for Solid Carbonaceous Materials. Filed Dec. 23, 1977.

Patent application 868,634. Valve System Incorporating Single Failure Protection Logic. Filed Jan. 11, 1978.

Patent application 868,953. Method for Calcining Nuclear Waste Solutions Containing Zirconium and Halides. Filed Jan. 12, 1978.

Patent application 871,919. Sintered Rare Earth—Iron Laves Phase Magnetostrictive Alloy Product and Preparation Thereof. Filed Jan. 24, 1978.

Patent application 878,047. Apparatus for Leaching Core Material From Clad Nuclear Fuel Pin Segments. Filed Feb. 15, 1978.

Patent application 880,678. Structure for Ceramic MHD Components. Filed Feb. 23, 1978.

Patent application 880,679. Self Locking Drive System for Rotating Plug of a Nuclear Reactor. Filed Feb. 23, 1978.

Patent application 880,820. Apparatus and Method for Feeding Coal Into a Coal Gasifier. Filed Feb. 23, 1978.

Patent application 880,918. Pyrolytic Coating Process. Filed Feb. 24, 1978.

Patent application 880,919. Method for Homogenizing Alloys Susceptible to the Formation of Carbide Stringers and Alloys Prepared Thereby. Filed Feb. 24, 1978.

Patent application 880,920. Method and Apparatus for Removing the Surface Layer From a Concrete Object. Filed Feb. 24, 1978.

Patent application 886,380. Alternate Liquid Fuel (A.L.F.) Compound and Method for Processing. Filed Mar. 14, 1978.

Patent application 889,691. System for Loading Slab-Gel Holders for Electrophoresis Separation. Filed Mar. 24, 1978.

Patent application 904,676. Rim for Rotary Inertial Energy Storage Device and Method. Filed May 10, 1978.

Patent application 904,678. Right/Left Assignment in Drift Chambers and Proportional Multiwire Chambers (PWC'S) Using Induced Signals. Filed May 10, 1978.

Patent application 906,308. Secondary Hardening Steel Having Improved Combination of Hardness and Toughness and Method of Preparation. Filed May 15, 1978.

Patent application 906,815. Manipulator for Rotating and Examining Small Spheres. Filed May 17, 1978.

Patent application 906,820. Reflecting Film Reflector and Method of Making the Same. Filed May 17, 1978.

Patent application 908,031. Enhancement of Laser Pulse Contrast Ratios Via Transient Response of Narrow Band Resonant Absorbers. Filed May 22, 1978.

Patent application 909,864. Ideal Light Concentrators With Reflector Gaps. Filed May 26, 1978.

Patent application 911,248. Pulse Circuit for Gas Discharge Laser. Filed May 31, 1978.

Patent application 912,784. Adjustable Expandable Cryogenic Piston and Ring. Filed June 5, 1978.

Patent application 912,785. Alternating Phase Focused Linacs. Filed June 5, 1978.

Patent application 913,634. Differentially-Charged and Sequentially-Switched Square-Wave Pulse Forming Network. Filed June 8, 1978.

Patent application 915,419. Ceramic Component for Electrodes. Filed June 14, 1978.

Patent application 916,614. Corrosion Monitoring Apparatus. Filed June 19, 1978.

Patent application 918,259. Count-Doubling Time Safety Circuit. Filed June 23, 1978.

Patent application 918,618. Carbonaceous Fuel Combustion With Improved Desulfurization. Filed June 23, 1978.

Patent application 920,414. Electrochemical Cell and Method of Assembly. Filed June 29, 1978.

Patent application 920,415. Thermally Stable, Plastic-Bonded Explosives. Filed June 29, 1978.

Patent application 923,753. Post Pulse Shutter for Laser Amplifier. Filed July 11, 1978.

Patent application 924,336. Method and Apparatus for Forming Targets Using Light Pulses. Filed July 13, 1978.

Patent application 927,237. Method for Forming or Bonding a Liner. Filed July 24, 1978.

Patent application 927,442. Linear Motor Drive System for Continuous-Path Closed-Loop Position Control of an Object. Filed July 24, 1978.

Patent application 927,806. Valve for Controlling Solids Flow. Filed July 25, 1978.

Patent application 928,026. Process for Recovering Actinide Values. Filed July 25, 1978.

Patent application 928,027. Laser Target Fabrication, Structure and Method for Its Fabrication. Filed July 25, 1978.

Patent application 929,144. Method of Foaming a Liquid Metal. Filed July 28, 1978.

Patent application 930,616. Compensated Pulsed Alternator. Filed Aug. 3, 1978.

Patent application 930,629. Method and Apparatus for Controlling Accidental Releases of Tritium. Filed Aug. 3, 1978.

Patent application 930,782. Frost-Proof and Moisture-Proof Building Foundation. Filed Aug. 3, 1978.

Patent application 932,151. Internal Ring End Stoppering for Open Ended Plasma Containing Multicoil Solenoid. Filed Aug. 9, 1978.

Patent application 934,552. Means and Method for the Destruction of Particles Entrained in a Gas Stream. Filed Aug. 17, 1978.

Patent application 934,762. Recovery of Aluminum and Other Metal Values From Fly Ash. Filed Aug. 17, 1978.

Patent application 934,763. Multi-Atmospheric Halogen Compatible Cavity. Filed Aug. 17, 1978.

Patent application 934,764. Miniaturized Radiation Chirper. Filed Aug. 17, 1978.

Patent application 934,765. Synthetic Carbonaceous Fuels and Feedstocks. Filed Aug. 17, 1978.

Patent application 934,768. Process for Producing Hydrogen From Water Using Cobalt and Barium Compounds and Compositions Useful Therein. Filed Aug. 17, 1978.

Patent application 936,458. Beam/Seam Alignment Control for Electron Beam Welding. Filed Aug. 24, 1978.

Patent application 936,460. Preparation of U_3O_8. Filed Aug. 24, 1978.

Patent application 938,141. Liquid-Permeable Electrode. Filed Aug. 30, 1978.

Patent application 942,227. Enhancement of Laser Pulse Contrast Ratios Via Transient Response of Narrow Band Resonant Interferometers. Filed Sept. 14, 1978.

Patent application 942,228. Mosaic of Coded Aperture Arrays. Filed Sept. 14, 1978.

Patent application 942,230. Hand and Shoe Monitor. Filed Sept. 14, 1978.

Patent application 943,270. Scalable, High Power Laser Cavity for Static Metal Vapor Laser Media. Filed Sept. 15, 1978.

Patent application 943,827. MHD Generating System. Filed Sept. 19, 1978.

Patent application 945,375. Use of a Large Time-Compensated Scintillation Detector in Neutron Time-of-Flight Measurements. Filed Sept. 25, 1978.

Patent application 945,376. Fiber Optic Solid State Switch. Filed Sept. 25, 1978.

Patent application 945,923. Nonimaging Radiant Energy Direction Device. Filed Sept. 26, 1978.

Patent application 945,924. Portable Probe To Measure Sensitisation of Stainless Steel. Filed Sept. 26, 1978.

Patent application 945,925. Method for Laser-Annealing Silicon. Filed Sept. 26, 1978.

U.S. DEPARTMENT OF TRANSPORTATION

Patent Counsel, 400 7th St., SW., Washington, D.C. 20590

Patent application 6-063,819. Rail Flaw Detector Position Control. Filed Aug. 6, 1979.

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

National Institutes of Health, Chief, Patent Branch
Westwood, Bldg., Bethesday, Md. 20205

Patent Re. 29,888. System for Whole Body Imaging and Count Profiling With a Scintillation Camera. Filed Sept. 29, 1976. Reissued Jan. 23, 1979. Not available NTIS.

Patent 4,175,133. 1,2-Diaminocyclohexane Platinum (II) Complexes Having Antineoplastic Activity Against L1210 Leukemia. Filed Nov. 29, 1977. Patented Nov. 20, 1979. Not available NTIS.

Patent 4,177,348. Carbocyclic Analogs of Cytosine Nucleosides. Filed Dec. 13, 1977. Patented Dec. 4, 1979. Not available NTIS.

U.S. DEPARTMENT OF THE INTERIOR

Branch of Patents, 18th and C St., NW
Washington, D.C. 20240

Patent 4,166,775. Electrochemical Gas Monitoring Method. Filed Sept. 22, 1977. Patented Sept. 4, 1979. Not available NTIS.

Patent 4,167,477. Separation of Plastics by Flotation. Filed Jan. 17, 1978. Patented Sept. 11, 1979. Not available NTIS.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification. Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Birmingham Public Library	(205) 254-2555
California	Los Angeles Public Library	(213) 626–7555 Ext. 274
	Sacramento: California State Library	(916) 322–4572
	Sunnyvale Patent Library*	(408) 736-0795
Colorado	Denver Public Library	(303) 573-5152 Ext. 223
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4519
Illinois	Chicago Public Library	(312) 269-2814
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
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Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214
Nebraska	Lincoln: University of Nebraska-Lincoln, Love Library	(404) 472-3411
New Jersey	Newark Public Library	(201) 733-7740
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 790-6291
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County Public Library	(513) 369-6969
	Cleveland Public Library	(216) 623-2932
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 242–7361 Ext. 258
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1226
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3128
	University Park: The Pennsylvania State Libraries	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 224
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 528-2957
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library. Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF APRIL 5, 1980

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—R. FRIEDMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy: Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	6-18-79
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director. Heterocyclic Amides; Alkaloics; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	2-5-79
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthodontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	4-19-79
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director. Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	8-2-79
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Grs, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	4-12-79
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	10-25-78
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy; Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	1-23-79
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—N. ANSHER, Director. Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	3-9-79
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director. Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling.	9-5-78
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	10-3-78
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	4-12-78
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—M. M. NEWMAN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers, Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	1-8-79
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	3-15-79
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—B. R. GRAY, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	4-9-79
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	11-8-78
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—G. M. FORLENZA, Director. Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Misc. Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements, Clutches.	11-28-78

Expiration of patents: The patents within the range of numbers indicated below expire during April 1980, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents.—Numbers 3,083,367 to 3,088,113, inclusive
Plant Patents.—Numbers 2,244 to 2,257, inclusive

PATENT EXAMINING CORPS

REXFORD TUGWELL, Assistant Commissioner

WILLIAM PERLMAN, Deputy Assistant Commissioner

CHRISTMAS OF PATENT ATTRACTIONS AS OF APRIL 2, 1936

PATENT EXAMINING GROUPS

REISSUES

MAY 13, 1980

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 30,272

RECOVERY OF CELLULAR PROTEIN PRODUCTS FROM MICROBIOLOGICAL SYNTHESIS MASSES

Donald O. Hitzman, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Ohio

Original No. 3,958,038, dated May 18, 1976, Ser. No. 418,915, Nov. 26, 1973. Application for reissue Dec. 30, 1976, Ser. No. 755,762

Int. Cl.[2] **A23J** *1/00*

U.S. Cl. 426—656 **8 Claims**

10. A process of recovering microbiologically produced cells from the medium in which they were produced comprising adding to the cell-containing medium gluten in an amount sufficient to cause flocculation at a pH in the range of 4 to 6, said addition of said gluten being made when said cell-containing medium is at a pH in the range of 4 to 6 that will permit flocculation, and then physically separating the flocculated cells from the medium in which they were produced.

Re. 30,273

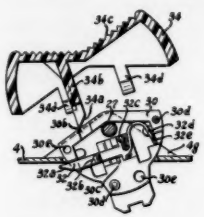
ROCKER SWITCH WITH INTEGRAL OFF LOCK

Stuart W. Grebner, Euclid, Ohio; James V. Johnson, Jr., and Leonardus J. Josemans, both of Smithfield, N.C., assignors to Eaton Corporation, Cleveland, Ohio

Original No. 4,013,858, dated Mar. 22, 1977, Ser. No. 592,411, Jul. 2, 1975. Application for reissue Mar. 3, 1978, Ser. No. 883,352

Int. Cl.[2] **H01H** *9/28*

U.S. Cl. 200—42 T **14 Claims**



12. A self-enclosed pivoted-actuator switch comprising:

an insulating housing;

stationary contact means within said housing connected to external terminals;

movable contact means within said housing selectively operable to an "on" position closing a circuit with respect to said stationary contact means or to an "off" position opening said circuit;

an actuator assembly;

supporting means on said housing pivotally mounting said actuator assembly for reciprocal movement to actuate said movable contact means;

and said actuator assembly comprising:

contact actuator means extending from said pivotal supporting means into said housing for actuating said movable contact means to said "on" or "off" position;

a spring-biased locking member having a locking position and an unlocking position and projecting from said contact actuator means in its said locking position to catch on said housing thereby to prevent pivotal movement of said actuator assembly;

a removable operating member having a manually-engageable portion and means for coupling the same to said contact actuator means so that selective actuation thereof by said manually-engageable portion effects pivotal movement of both said removable operating member and said contact actuator means coupled thereto and means on said removable operating member which when inserted into said contact actuator means together with said coupling thereof moves said locking member against the force of its bias spring into said unlocking position clear of said housing to afford normal pivotal movement of said actuator assembly;

and said means for coupling said operating member to said contact actuator means comprises snap-on connection means for normally retaining said operating member on and firmly secured to said contact actuator means during actuation thereof to afford normal operation and for providing ready pull-off removability of said operating member to prevent unauthorized operation of said switch.

Re. 30,274

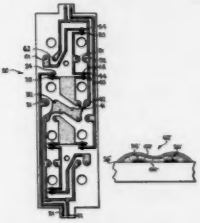
METHOD FOR MAKING A CIRCUIT BOARD AND ARTICLE MADE THEREBY

Donald A. Bolon, Scotia; Gary M. Lucas, Schenectady, both of N.Y., and Ralph L. Bartholomew, Painesville, Ohio, assignors to General Electric Company, Schenectady, N.Y.

Original No. 3,988,647, dated Oct. 26, 1976, Ser. No. 509,893, Sep. 27, 1974. Application for reissue Apr. 21, 1978, Ser. No. 899,096

Int. Cl.[2] **G03B** *15/02*

U.S. Cl. 361—411 **7 Claims**



12. A circuit board for activating high voltage flash lamps, said circuit board including a non-conductive, thermoplastic substrate having a patterned electrically conductive coating on one of its surfaces and defining electrical circuitry for the flash lamps, said coating having a resistivity of less than 10 ohm-cm and comprising an organic resin matrix which has been cured into a non-tacky condition by ultraviolet radiation, said coating further comprising a particulated electrically conductive material selected from the group consisting of a particulated electrically conductive metal and a particulated electrically conductive metal containing material, including mixtures thereof, with no more than up to about **15%** by weight of said particulated electrically conductive material having an aspect ratio of diameter to thickness of a value greater than **20**.

PLANT PATENTS

GRANTED MAY 13, 1980

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,534

SUGAR MAPLE

John D. Siebenthaler, Dayton, Ohio, assignor to The Siebenthaler Company, Dayton, Ohio

Filed Aug. 21, 1978, Ser. No. 935,333

Int. Cl.[2] A01H *5/00*

U.S. Cl. Plt.—51 **1 Claim**

1. A new and distinct variety of *Acer sacchrum* substantially as herein shown and described, characterized particularly by its rapid growth, hardiness, uprightness and conical shape of the tree at maturity and the distinctive coloration of the foliage.

4,535

AZALEA PLANT

Louis A. Hindla, 986 Church St., Bohemia, N.Y. 11716

Filed Feb. 21, 1979, Ser. No. 13,541

Int. Cl.[2] A01H *5/00*

U.S. Cl. Plt.—56 **1 Claim**

1. A new and distinct variety of azalea plant, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of purplish pink flowers borne in abundance in irregular rounded clusters on strong stems, the reverse of each flower petal having a nearly white stripe extending from the base at the center thereof, the evergreen, glossy dark green foliage retained well in winter, and the tall upright habit.

PLANT PATENTS

GRANTED MAY 12, 1980

PATENTS

GRANTED MAY 13, 1980

ERRATA

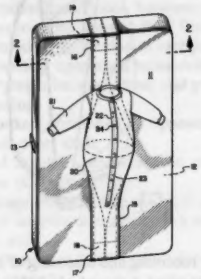
For CLASS	See PATENT NO.
024–263 R	4,202,087
433–189	4,202,097
433–168	4,202,098
433–176	4,202,099
433–007	4,202,100
433–225	4,202,101
433–127	4,202,102
433–153	4,202,103
331–094.5 G	4,202,104
368–272	4,202,165
368–082	4,202,166
568–793	4,202,199
221–093	4,202,468
254–093 H	4,202,514
239–177	4,202,596
401–196	4,202,652
430–050	4,202,693
430–215	4,202,694
430–008	4,202,695
430–306	4,202,696
430–306	4,202,697
430–418	4,202,698
430–302	4,202,699
210–032	4,202,737
210–022 A	4,202,760
430–106	4,202,785
548–204	4,202,818
556–467	4,202,831
424–311	4,202,841
525–302	4,202,845
430–106	4,202,913
375–116	4,203,002
455–111	4,203,003
174–135	4,203,004
370–050	4,203,008
307–252 C	4,203,047
375–001	4,203,070
375–001	4,203,071
455–223	4,203,072
455–311	4,203,073
367–143	4,203,089
343–781 P	4,203,105

PATENTS

GRANTED MAY 13, 1980

GENERAL AND MECHANICAL

4,202,052
EXTENDABLE INFANT SHEET AND SLEEPER
Lydia K. Bilanzich, 4575 Willow Rd., Salt Lake City, Utah 84117
Filed May 22, 1978, Ser. No. 908,534
Int. Cl.[2] A47G *9/00*
U.S. Cl. 2—69.5 **8 Claims**

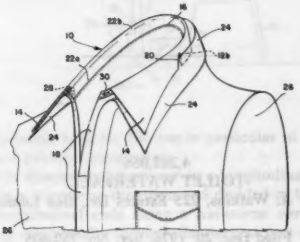


1. An infant sheet for use with a crib or bed mattress comprising:
a sheet member having a length greater than the length of said mattress and adapted for placement thereon;
a central pleat formed in said sheet member and extending the length thereof, said pleat being fixed in nonextending form at opposing end locations which are substantially centered along the width of said sheet member;
an extendable section of said central pleat formed in said sheet member between the fixed, nonextending pleat sections at said end locations; and
a central opening in said sheet member extending across said central pleat and adapted in configuration for attachment of a jacket member thereto.

4,202,053
WEATHER-PROOF GARMENT
Michael Bell, P.O. Box 400, Warrington, Pa. 18976
Filed Nov. 15, 1978, Ser. No. 960,886
Int. Cl.[2] A41D *3/08*
U.S. Cl. 2—84 **7 Claims**

1. A garment for disposition on the trunk of a wearer and formed of a flexible, water-repellent material said garment having a front panel including an opening therein, a relatively rigid, transparent window pane and releasable securement means, said front panel including an inner surface, the periphery of said opening being defined by upper, lateral and lower edge portions, said window pane including an inner and outer surface, the periphery of said window pane being defined by upper, lateral and lower edge portions, said releasable securement means releasably securing the outer surface of said window pane along its upper and lateral edge portions to the inner surface of said front panel along the upper and lateral edge portions of said opening with said upper and lateral edge portions of said panel overlapping said upper and lateral edge portions of said window pane and with said lower edge portion of said window pane overlapping said lower edge portion of said panel to completely cover said opening in a good weathertight relationship.

4,202,054
COLLAR CONSTRUCTION
Epifanio A. Siragusa, 519 Montauk Ave., New London, Conn. 06320
Filed Jul. 17, 1978, Ser. No. 925,426
Int. Cl.[2] A41B *1/00*
U.S. Cl. 2—116 **7 Claims**



1. A collar adapted to be used in a garment such as a shirt sport shirt, or the like, comprising: an elongated panel having pointed front portions at opposite ends thereof, said panel including a free marginal edge and a connecting marginal edge extended between said pointed portions, said connecting marginal edge being adapted to be secured at the neckline of said garment, a plurality of slits spaced apart from each other, each slit extending from the free marignal edge and ending close to said connecting marginal edge, and a central inner rear portion extended substantially between said slits whereby said pointed portions being movable independently from each other and from said central inner rear portion without disturbing the overall appearance of the collar when the latter is used as an open sport collar over the lapels of the wearer's jacket.

4,202,055
ANCHORAGE FOR HIGHLY STRESSED ENDOPROSTHESES
Roland Reiner, Eschborn; Helmut Heide, Schwalbach, and Kari Koster, Lorsbach, all of Fed. Rep. of Germany, assignors to Battelle-Institut e.V., Frankfurt am Main, Fed. Rep. of Germany
Filed May 12, 1977, Ser. No. 796,164
Claims priority, application Fed. Rep. of Germany, May 12, 1976, 2620907
Int. Cl.[2] A61F *1/24*
U.S. Cl. 3—1.91 **9 Claims**

1. An implantable prosthesis anchorage which contains a non-porous outer coating in the regions which will be positioned in contact with bone, the non-porous outer coating

consisting of (i) at least one bioactive resorbable ceramic material which is a calcium phosphate and (ii) at least one polymer which is mechanically and chemically stable in the body, the ceramic material being in particulate form having particle diameters between 0.5 and 1 mm, and the ceramic material

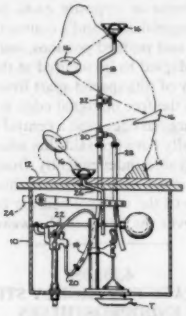
particles being incorporated in the polymer in such a way that resorption of the ceramic material leads to a polymer structure with continuous pores filled with living bone tissue, bioactivating bonding residues of the ceramic material being left on the inner surfaces of the filled pores which have been created by the resorption of the ceramic material.

4,202,056

TOILET WATERFALL

Christopher A. Watkins, 225 Estates Dr., Ben Lomond, Calif. 95005

Filed Dec. 20, 1976, Ser. No. 752,605
Int. Cl.[2] A47K *17/00*
U.S. Cl. 4—1 **3 Claims**



1. A toilet waterfall for a standard flush tank including a water inlet which comprises

a cover arranged to rest on the open top of the toilet flush tank,

a series of drip pans supported above and by said cover in staggered and superposed relation,

a first conduit arranged for connection to the water inlet of the flush tank at one end and to discharge water into the uppermost one of said drip pans at its opposite end, and

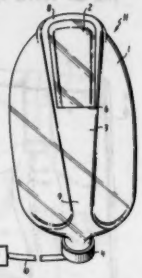
a second conduit connected between the lowermost one of said drip pans and said flush tank.

4,202,057

DEVICE FOR RECEIVING AND DISPOSING OF URINE FROM BEDRIDDEN WOMEN

Guillermo N. Ibarra, Calle General San Martin No. 222, Col. Reforma, Guadalajara, Jal., Mexico

Filed Sep. 5, 1978, Ser. No. 939,776
Int. Cl.[2] A61G *9/00*
U.S. Cl. 4—144.3 **5 Claims**



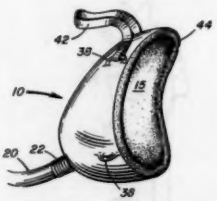
1. A device for receiving and disposing of urine from bedridden women, comprising a receptacle having the shape of an ellipse along the major axis of which there is arranged a raised portion having approximately the shape of an isosceles triangle with slightly rounded vertices, an opening in said raised portion adjacent the base of said triangle, grooves provided in said receptacle on opposite sides of said raised portion, said grooves running lengthwise and curving from the base side of the receptacle up to the opening in the raised portion for anatomical adaptation to a bedridden woman using the receptacle and a urine discharge tube arranged on the base side of the receptacle opposite the raised portion and wherein the raised portion has a cover portion which extends over approximately half its length from its smaller vertex to the base of the isosceles triangle; and wherein the widest part of the receptacle corresponds to the narrowest part of the opening in the raised portion.

4,202,058

FEMALE URINAL

Robert W. Anderson, 1765 S. 79th East Ave., Tulsa, Okla. 74112

Filed Oct. 31, 1978, Ser. No. 956,106
Int. Cl.[2] A61G *9/00*
U.S. Cl. 4—144.3 **4 Claims**



1. A urinal for supine or reclining female use comprising:

a rigid outer shell defining an open chamber, edge portions of said outer shell defining a generally oval-shaped opening for the chamber;

a flexible inner shell defining a receiving chamber positionable within said outer shell in such manner that edge portions of said inner shell protrude outwardly beyond edge portions of said outer shell, said protruding edge portions being deformable and said generally oval shape being such that said urinal is sealingly engaged with body

parts of an intended user when the urinal is pressed against the body parts;

said outer shell including an aperture defined therein and said inner shell including a duct section that communicates with the receiving chamber and extends through said aperture when said inner shell is positioned in said outer shell;

manually powered pump means connectable to said duct section for evacuating urine from said receiving chamber after or during use of said urinal;

a first tubing section for connecting an inlet of said pump means to said duct section;

one-way valve means, positioned between the pump inlet and said duct section for limiting fluid flow to a direction extending from said duct section to said pump means; and

a second tubing section connected to an outlet of said pump means for carrying urine away from said pump means; and further comprising

a first pair of brackets positioned on opposite sides of upper portions of said outer shell;

a second pair of brackets positioned on opposite sides of lower portions of said outer shell;

adjustable hip straps connected to said first and second pairs of brackets for holding said urinal on a user in a position ready for use; and

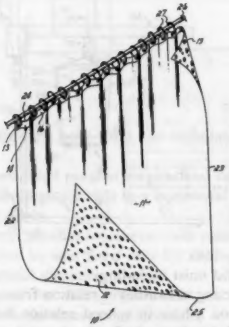
a hanger connected to said outer shell for suspending said urinal from a support.

4,202,059

REVERSIBLE SHOWER CURTAIN

Raymond F. Faragher, Jr., 620 Sunset Ct., Kenton Hills, Ky. 41011

Filed Jul. 25, 1977, Ser. No. 818,803
Int. Cl.² A47K *3/14*
U.S. Cl. 4—149 **7 Claims**



1. A four-piece reversible shower curtain having two sides, each side presenting a different aesthetic appearance from the other side, said curtain consisting of:

a laminated curtain composite of two sheets, said sheets being coextensive from end-to-end and from top to bottom such that the edges of said curtain are absent of fold-over hems;

each of said sheets having an inner side laminated to the inner side of the other sheet and each of said sheets having an outer side being totally uniform in its design and color and totally independent of the outer side of said other sheet whereby, each outer side presents a different aesthetic appearance from the other outer side; and

a header structure consisting of a stiffening strip attached to an outer side of one of said sheets at an upper edge portion thereof, and a separate cover strip attached to said one sheet and being coextensive with and covering said stiffening strip, the ends of said covering strip being coextensive with respective ends of said two sheets, and said two sheets extending coextensively beneath said cover and stiffening strips to form a major portion of said curtain;

said covering strip comprising aesthetically a continuation of the aesthetic appearance presented by the outer side of said one sheet such that said covering strip and said outer side of said one sheet together cooperate to produce a uniform aesthetic appearance different from that presented by the outer side of the other sheet;

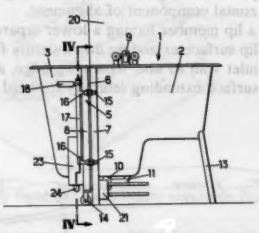
said curtain being reversible such that the aesthetic appearance presented by one outer side is not visible to a person viewing the curtain from the opposite outer side thereof.

4,202,060

OPENABLE BATH

Pierre Touze, 11, Rue G. Faussart, 92150 Suresnes, France

Filed Sep. 11, 1978, Ser. No. 941,078
Claims priority, application France, Sep. 15, 1977, 77 27947
Int. Cl.² A47K *3/02*
U.S. Cl. 4—173 R **7 Claims**



1. An openable bath for the use in particular of elderly or handicapped persons, comprising:

a bath tub dimensionally greater in a longitudinal direction than in a transverse direction and divided in between its two longitudinal ends along a transverse vertical plane passing substantially through the deepest part of the bath tub into a fixed tub part and a movable tub part pivoted to the fixed part about a vertical pivotal axis located on one longitudinal side of the bath tub,

a compressible seal extending around the two sides and the bottom of one of said two parts in the contact plane of said two parts,

closure means located on the longitudinal side of the bath tub opposite to that of said pivotal axis for urging a contact surface of said movable part against a contact surface of said fixed part while compressing said seal, said tub parts then defining a bathing interior,

a closure security device including locking means governed by a float responsive to the water level in the bath tub for locking the closure device in a closed position and holdng it locked while the bath tub contains water,

a bath tap assembly for directly filling the bath tub with water, and

filling security means for preventing the supply of water to said bath tap assembly when said bath tub is not completely closed.

4,202,061

LAVATORY WASTEWATER DISPOSAL SYSTEM FOR AIRCRAFT

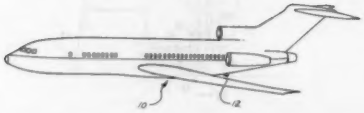
Kenneth L. Waters, Federal Way, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 29, 1978, Ser. No. 974,365
Int. Cl.² E03D *5/016*
U.S. Cl. 4—317 **28 Claims**

1. A waste liquid disposal system for an aircraft comprising:

a. means defining a compartment capable of being pressurized by a source of pressurized air,

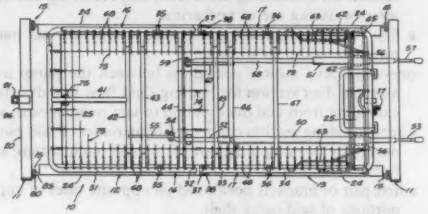
b. a source of waste liquid,
c. a disposal tank to receive said liquid,
d. a drainmast line to direct said liquid to an ambient location,
e. a diverting apparatus to direct said liquid to said disposal tank when said compartment is at a pressure substantially equal to pressure at said ambient location, and to direct said liquid to said drainmast line when pressure in said compartment is at least as high as a predetermined pressure level above pressure at said ambient location, said apparatus comprising:
1. inlet means having a downwardly extending rear inlet wall and a downwardly extending front inlet wall, said front and rear inlet walls defining an inlet,
2. means defining a diverting chamber positioned below said inlet, said diverting means having
a. a rear generally planar chamber wall extending downwardly from said rear inlet wall as a downward extension thereof, said rear chamber wall being generally vertically aligned so as to have a vertical component of alignment substantially greater than a horizontal component of alignment,
b. a lip member having a lower separating edge, a rear lip surface extending downwardly from said forward inlet wall to said separating edge, and a forward lip surface extending laterally forward from said edge,



c. a diverting wall having a diverting wall surface extending from said forward lip surface on a slant downwardly and forwardly, and disposed generally oppositely to said back wall,
d. said forward lip surface and an upward portion of said diverting wall defining a recess,
3. a first oulet means leading downwardly from said chamber at a lower end of said chamber back wall and connecting to said disposal tank in a manner that liquid flowing downwardly adjacent said chamber back wall flows into said first outlet means,
4. a second outlet means leading forwardly from said chamber at a location adjacent a lower end of said front chamber wall in a manner that liquid flowing downwardly adjacent said front chamber wall is able to enter said second outlet means and flow through said drainmast line,
f. vent means operatively connecting said inlet means and said first outlet means to pressurized air for said compartment,
whereby when said compartment is at the pressure substantially equal to the pressure at the ambient location, said liquid flows from said inlet means along said chamber back wall into said first outlet means, and when pressure in the compartment is at least as high as said predetermined pressure level above the pressure at the ambient location, said liquid is caused to flow from the inlet means adjacent said chamber forward wall and through said second outlet means.

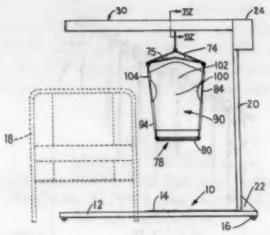
4,202,062
KNOCK-DOWN INVALID BED
Stanley T. Marcyan, Glendale, Calif., assignor to Marcy Tool Company, Glendale, Calif.
Filed Jul. 10, 1978, Ser. No. 923,243
Int. Cl.[2] A61G 7/10
U.S. Cl. 5—66 **5 Claims**

1. That improvement in a knock-down bed having a main frame detachably supported at its ends by head boards and readily separable into two halves at the midlength thereof which comprises:
each half of said main frame including a mattress support comprising link fabric means resiliently supported along its sides and at one end by a respective tubular sub-frame and including coil spring means detachably interconnecting the adjacent end halves of said link fabric means; and



said tubular frame including a plurality of tubular struts having the major portion thereof spaced below and extending crosswise of said link fabric means with their ends rigidly fixed to the sides of said tubular sub-frame at spaced apart points therealong.

4,202,063
PATIENT LIFTING DEVICE
James B. Murray, P.O. Box 145, 301 E. Kalamazoo St., Bloomingdale, Mich. 49026
Filed Aug. 8, 1978, Ser. No. 932,011
Int. Cl.[2] A61G 1/02; A61H 1/02
U.S. Cl. 5—81 R **8 Claims**



1. In an invalid hoist including:
a beam projecting in cantilever relation from an upright post supported on a base in spaced relation below the beam, said beam being formed of a sheet metal panel of a generally box shaped section having a top wall, spaced side walls and spaced apart inturned rail flanges on the lower edges of said side walls;
a carriage longitudinally movably supported within said beam;
a lifting cable having a free end depending from said carriage; and
a patient supporting harness connected to the free end of said cable, wherein the improvement comprises:
a rotatable tubular drum substantially enclosed inside said beam, said beam supporting said rotatable drum for longitudinal movement therewithin;
said beam enclosing therewithin said lifting cable wound on said drum, said lifting cable having its free end exiting from said beam downward between said inturned rail flanges;
a noncircular cross section shaft enclosed within said beam and rotatably supported at its ends by said cantilevered beam, said carriage supporting said drum for rotation with

respect thereto and for said longitudinal movement of said drum within said beam;

means movable with said carriage along said beam and connected to said drum to engage the noncircular parts of said shaft to rotate said drum with said shaft; and

power means mounted on the end of said upright and drivingly connected to said shaft.

4,202,064

UNIT FOR VERTICAL AND HORIZONTAL PERSONAL TRANSPORT

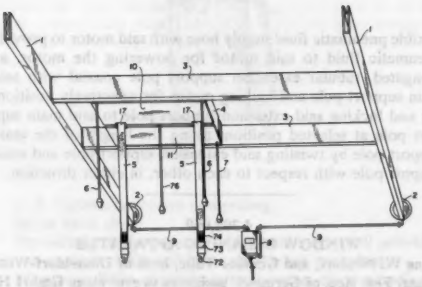
Gunnar I. Joergensen, Ellemosevej 39, DK-2900 Hellerup, Denmark

Filed Apr. 20, 1978, Ser. No. 898,407

Claims priority, application Denmark, Apr. 26, 1977, 1831/77

Int. Cl.[2] A61C *1/02*; A47C *17/40*

U.S. Cl. 5—83 **10 Claims**



1. A coordinate-type hoist for a non-ambulatory individual, comprising:

first and second fixed parallel longitudinal rails;

means for mounting said rails in a horizontal plane near the ceiling of a room;

third and fourth parallel transverse rails extending between and supported by said fixed rails for sliding movement in the longitudinal direction;

a crab mounted for sliding movement on said third and fourth rails in the transverse direction;

at least one hoisting strap depending from said crab for supporting an individual;

a rotatable shaft means on said crab for winding and unwinding said straps to raise and lower the same;

a hoist motor on said crab for rotating said shaft means;

means for electrically insulating said motor from said crab;

means including said longitudinal and transverse rails for supplying electrical power to said hoist motor;

limit switch means coupled to said shaft means for disconnecting the power supply to said hoist motor when the number of rotations of said shaft means in either direction exceeds a corresponding predetermined value;

cutoff switch means adjacent the paths of travel of said straps for disconnecting the power supply to said hoist motor when either of said paths deviate from a desired trajectory as a result of erroneous winding or unwinding thereof; and

means independent of said power supplying means for lowering said straps.

4,202,065

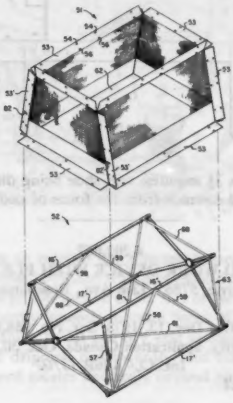
COLLAPSIBLE BABY ENCLOSURE

Barry J. Sullivan, #29, 670 San Antonio Rd., Palo Alto, Calif. 94301

Continuation-in-part of Ser. No. 799,790, May 23, 1977, abandoned. This application Jan. 13, 1978, Ser. No. 869,252

Int. Cl.[2] A47D *7/00*

U.S. Cl. 5—99 A **15 Claims**



1. A structurally rigid baby enclosure erectable from a collapsed condition comprising:

A. a baby containment structure of a pliant material including:

(1) a pair of opposed side panels;

(2) a pair of opposed end panels; and

(3) a bottom panel; and

B. a collapsible frame structure to support said enclosure including:

(1) four side rods extending generally parallel to one another for generally the full length of said structure respectively adjacent the upper and lower margins of said side panels; and

(2) a pair of collapsible end support structures coupled respectively at opposite ends of said frame structure to all four of said side rods, each of said end support structures being manipulatable between a frame collapsed position in which the ends of all four of said side rods coupled thereto are positioned close to one another; and a locked, frame erected position in which said end support structure maintains said side rods spread apart from one another at said end.

4,202,066

METHOD OF HEAT SETTING FOOTWEAR

Raymond Hanson, Rearsby, England, assignor to USM Corporation, Farmington, Conn.

Filed Apr. 20, 1978, Ser. No. 898,177

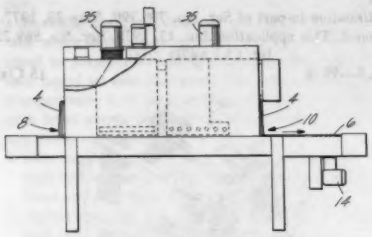
Claims priority, application United Kingdom, Jul. 20, 1977, 31030/77

Int. Cl.[2] A43D *9/00*

U.S. Cl. 12—142 R **3 Claims**

3. The method of heat seating a lasted leather shoe upper for retension of shape in the toe portion of the upper, the steps which comprise: conveying the lasted shoe bottom down at selected variable speed through a dry air stream at an elevated temperature, said air stream being maintained at the point of

contact with the upper at a temperature in the range of 120° to 130° C. and a velocity of not less than 5 meters per second for not more than 3½ minutes, said shoe being disposed at a substantially fixed distance from the force of said air stream.

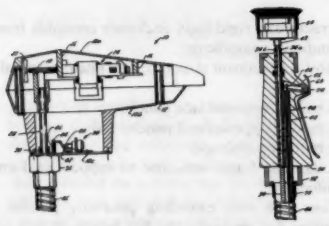


4,202,067

MOTORIZED WORK DEVICE WITH FLEXIBLE SHAFT

Bosko Stamatovic, 5786 - 13th Ave., Rosemount, Quebec, Canada

Filed Dec. 13, 1978, Ser. No. 968,962
Claims priority, application Canada, Oct. 30, 1978, 314734
Int. Cl.[2] A46B *13/02*
U.S. Cl. 15—28 **7 Claims**



1. A device for providing an angularly displaceable work tool at a point removed from the power source comprising drive means, switch means associated with the drive means for actuating the drive means between ON and OFF positions, a drive shaft connected to the drive means, the drive shaft comprising a flexible rotatable member connected at one end thereof to the drive means, the other end of the flexible drive shaft having a work tool associated therewith, and being secured thereto, a flexible non-extensible shaft connected at one end to the switch means, and being capable of being readily actuated to actuate the switch means, both of the flexible shafts being contained in a flexible protective housing, a housing providing a handle grip portion proximate said other end of the drive shaft, and trigger means mounted on said handle grip portion an operative relationship to said non-extensible shaft to actuate the switch means.

4,202,068

PORTABLE SCRUBBING TOOL

Frank R. Lester, Boynton Beach, Fla., and James Bullard, Adair, Okla., assignors to Nuvite Chemical Compounds Corporation, Brooklyn, N.Y.

Continuation-in-part of Ser. No. 944,354, Sep. 21, 1978. This application Nov. 14, 1978, Ser. No. 960,633
Int. Cl.[2] A46B *13/02*
U.S. Cl. 15—28 **20 Claims**

1. A lightweight, portable pneumatic powered scrubbing tool comprising a brush means for brushing a surface; a pneumatic powered motor having a motor drive shaft connected to said brush means for rotating said brush means, said motor being mounted adjacent to said brush means and of a size so as not to extend beyond the periphery of said brush means, an elongated, tubular main support pole, means for pivotally connecting one end of said main support pole to said motor, a first flexible pneumatic fluid supply hose positioned substantially along the entire length of said main support pole and disposed therewithin, means for interconnecting said first flexible pneumatic fluid supply hose with said motor to provide pneumatic fluid to said motor for powering the motor, an elongated, tubular extension support pole coaxial with said main support pole and locking means for selectively positioning and locking said extension support pole to said main support pole at selected positions along the length of the main support pole by twisting said extension support pole and main support pole with respect to each other, in either direction.

4,202,069

WINDOW CLEANING APPARATUS

Hans W. Nixdorf, and Günther Tölle, both of Düsseldorf-Wittlaer, Fed. Rep. of Germany, assignors to ever clean GmbH H. W. Nixdorf, Düsseldorf, Fed. Rep. of Germany

Filed Dec. 13, 1978, Ser. No. 968,983
Claims priority, application Fed. Rep. of Germany, Dec. 16, 1977, 2756126
Int. Cl.[2] B60S *1/50*
U.S. Cl. 15—250.03 **16 Claims**

1. A windscreen cleaning device for vehicles, adapted to be detachably connected to a windscreen wiper, comprising: a container defining an elongated cavity for receiving a water-soluble, substantially solid cleaning agent; said container comprising a support part forming a closed circumferential wall portion of the container and extending completely over and covering said cavity, said container also comprising a closure part adapted to be fitted to said support part such that the support part and closure part enclose the cavity, said closure part having a wall portion with a grid-like opening zone forming substantially the sole entrance into said cavity, said opening zone being adapted to admit into said cavity splash and rain water carried by a stream of air during motion of the vehicle

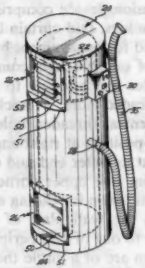
and also adapted to permit transfer of dissolved cleaning agent by said air out of said cavity onto a windscreen; said container also comprising means for detachably interconnecting said support part and said closure part; and connecting means connected to said support part for detachably connecting the cleaning device to a windscreen wiper in a position such that said closed circumferential wall portion of said support part which covers said cavity, forms the top side of said container and protects said cavity from rain while said vehicle is at rest, and such that said opening zone formed in said closure part points substantially downwardly in the direction towards said windscreen so that an exchange of liquid under the influence of the air stream may take place.

4,202,070

VACUUM APPARATUS WITH CONCRETE HOUSING, AND METHOD OF CONSTRUCTING SAME

Robert G. Harfst, 3751 NE. 192nd, Seattle, Wash. 98158

Filed Oct. 26, 1978, Ser. No. 955,131
Int. Cl.[2] A47L *5/38*
U.S. Cl. 15—300 A **38 Claims**



1. A vacuum apparatus comprising:
(a) an inner shell;
(b) vacuum means secured within said inner shell providing a suction within said inner shell when energized;
(c) a monolithic concrete outer housing disposed adjacent said inner shell surrounding said inner shell and enclosing the top and bottom thereof;
(d) a plurality of doors disposed on said housing each providing an opening within said housing and said inner shell and wherein one of said doors allows the removal of particles drawn into said inner shell, and another of said doors provides a vent for said vacuum means; and,
(e) a suction tube opening extending through said monolithic concrete outer housing and into said inner shell, said opening being disposed below said vacuum means and having a fitting therein attached to a suction tube such that when such vacuum means are energized, particles are drawn through said suction tube and said suction tube opening into said inner shell.

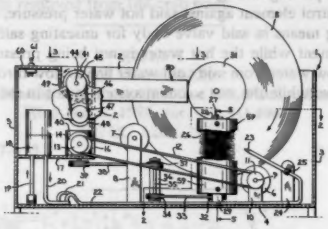
4,202,071

APPARATUS FOR WASHING AND DRYING PHONOGRAPH RECORDS

Mike A. Scharpf, 4624 Buehring Rd., Oshkosh, Wis. 54901

Filed Mar. 20, 1978, Ser. No. 888,216
Int. Cl.[2] B08B *5/02*
U.S. Cl. 15—302 **5 Claims**

1. An apparatus for washing and drying a phonograph record having a central label, comprising a container to contain a washing liquid, means disposed within the container for mounting a record for rotation about a horizontal axis, means for rotating the record, a pair of discharge jets disposed in spaced relation within the container and positioned to direct a washing liquid against opposite faces of the record, pumping means for delivering the washing liquid to said jets, a pair of brushes mounted for rotation about vertical axes and disposed circumferentially in the direction of record rotation from said jets, said brushes disposed to rotate in contact wth opposite faces of the record to clean the same, and air discharge means disposed circumferentially in the direction of record rotation from said brushes and disposed at a level above the jets, said pumping means and said air discharge means being operable simultaneously said air discharge means including an elongated



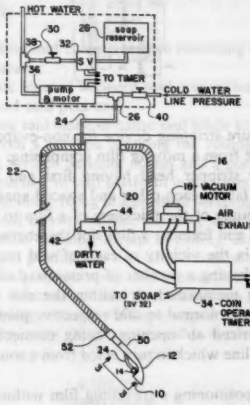
open ended slot to receive the rotating record, said air discharge means being provided with downwardly directed elongated air discharge passages on either side of the slot for directing air downwardly against opposite faces of the record to remove the washing liquid and dry said surfaces and prevent the liquid from dripping downwardly into contact with the label as the record rotates upwardly beyond said air discharge means.

4,202,072

ANTIFREEZE MEANS FOR CAR-WASH WET-VACUUM CLEANING MACHINES

Albert S. Gonzales, 11521 Morenci N.E., Albuquerque, N. Mex. 87112

Filed Jan. 18, 1979, Ser. No. 4,407
Int. Cl.[2] A47L *5/38*; B08B *5/00*
U.S. Cl. 15—302 **5 Claims**



1. In apparatus for cleaning carpets and the like in an open car wash bay, said apparatus comprising a wet vacuum system for vacuuming dirty water from a carpet through a hand tool connected to the vacuum system by a flexible hose, and said tool having a vacuum nozzle adjacent to an open water spray chamber and a spray nozzle in the chamber connected to a spray valve comprised of a body on the tool for manual control of hot water delivered under pressure by a flexible line, said apparatus further comprising means for pressurizing said hot water only while the wet vacuum system is in use, an improvement comprising

a T-fitting connected in said hot water line near said pressurizing means for connecting a cold water line at low pressure and flow rate to said hot water line,

a moveable control element in the body of said spray valve which closes against a valve set in said body under the pressure of said hot water to block flow of hot water into said open water spray chamber of said tool,

means passing through said body for manually unseating said control element against said hot water pressure, and

spring means in said valve body for unseating said control element while the hot water is not being pressurized to allow water from said cold water line to flow through said valve while the wet vacuum system is not in use.

4,202,073

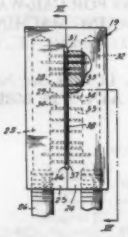
MOISTURE STRIPPING DEVICE FOR FILM CLEANING APPARATUS

Richard J. Hughes, Mt. Prospect, Ill., assignor to Research Technology Inc., Lincolnwood, Ill.

Filed Jul. 25, 1978, Ser. No. 927,751

Int. Cl.[2] B08B 5/02

U.S. Cl. 15—306 A **11 Claims**



1. A moisture stripping device for non-evaporatively stripping moisture from a moving film comprising:

a moisture stripper head having first and second planar surfaces facing each other and spaced apart by the order of magnitude of the thickness of a film to be stripped of moisture and forming a film slot therebetween,

said head, in the vicinity of each of said respective planar surfaces having a number of pressurized air openings for expelling pressurized air within the slot in a direction substantially normal to said respective planar surfaces,

said pressurized air openings being connected to a main pressure line which in turn is fed from a source of pressurized air,

means for positioning a travelling film within said film slot such that pressurized air from said air openings is generally directed against both surfaces of said film,

said film having a liquid coated thereon prior to entering the vicinity of said film slot, and

the pressure of air passing through said pressurized air openings substantially normal to the surfaces of said film being established at a level that provides a moisture barrier at the region of entry of the film into the film slot,

whereby the air pressure at the region of entry of the film into said slot effectively non-evaporatively strips moisture from the surface of the film and substantially minimizes formation of a mist of removed moisture.

4,202,074

CURTAIN SUSPENSION DEVICES

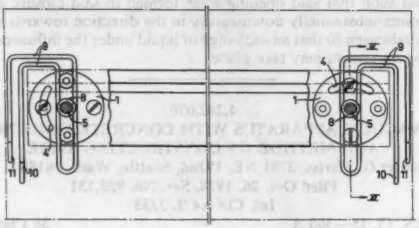
Göran J. F. Härd Af Segerstad, Borgmästarvagen 4, S-19030 Sigtuna, Sweden

Filed Oct. 4, 1978, Ser. No. 948,418

Claims priority, application Sweden, Oct. 7, 1977, 7711310

Int. Cl.[2] A47H 1/04

U.S. Cl. 16—94 D **2 Claims**



1. A curtain suspension device comprising a curtain board and a pair of stem brackets, said curtain board having a horizontal hole at each end for engagement by one of said pair of stem brackets, each of said brackets comprising a wall plate having peripheral holes for fastening to a wall by means of screws, a central threaded hole, a bracket stem threadably engagable with the central threaded hole, said bracket stem extending in engaged position at right angles to the wall surface so as to support at its outer end said curtain board, and a spring clip for securing one upper corner of a curtain, said spring clip engaging said stem for sliding movement in a vertical direction wherein the wall plate of each stem bracket, diametrically opposite to one of said peripheral holes includes a slot in the form of an arc of a circle the center of which is coplanar with the center of said one of said peripheral holes whereby the wall plates of said two stem brackets can be mounted in a manner such that the symmetry axes of the respective wall plates through the peripheral hole, the center hole and the slot intersect at an angle of 90°.

4,202,075

DEVICE FOR FILLING A SHIRRED TUBULAR CASING

Wolfgang Michel, and Reinhold Becker, both of Wiesbaden, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed May 3, 1978, Ser. No. 902,413

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1978, 2809385

Int. Cl.[2] A22C 11/02

U.S. Cl. 17—41 **17 Claims**

1. A calibrating device for use with a stuffing machine having a stuffing horn for uniformly controlling the filling of a shirred tubular casing with a food composition flowing under pressure from said stuffing horn, comprising a hollow calibrating pipe having a central bore therethrough for mounting said calibrating pipe on said stuffing horn, and having an enlarged circumference at one end thereof which stretches said casing and applies a frictional force thereto as said casing is drawn over said calibrating pipe during the filling of said casing, at least that portion of said calibrating pipe having said enlarged circumference being formed of a resilient material, wherein

said calibrating pipe is of a length sufficient to carry an entire length of shirred tubular casing, said calibrating device further comprising means for securing said casing to said calibrating pipe at the end thereof opposite said enlarged end, wherein said calibrating pipe has depressions therein at the end opposite said enlarged end, and said means for securing said casing to said pipe comprises a ring having projections which engage the depressions in said pipe to secure said casing thereon.

4,202,076

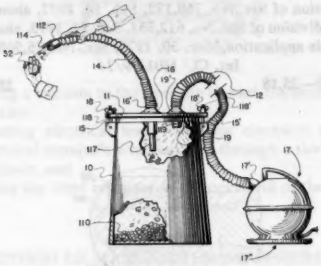
SUCTION CRAB PICKER SYSTEM SUITABLE INTER ALIA FOR HOME USE

Paul Rancatore, 7900 Danube St., New Orleans, La. 70126

Continuation of Ser. No. 635,889, Nov. 28, 1975, abandoned. This application Aug. 16, 1977, Ser. No. 825,080

Int. Cl.[2] A22C *29/00*

U.S. Cl. 17—48 **2 Claims**



1. A method of extracting meat from the bodies of crabs which comprises the following steps:

(a) preliminarily processing the crab body to at least partially expose the meat including the following sub-steps -

(a-i) removing the upper outer shell (carapace) and the legs;

(a-ii) removing the entrails, etc.;

(a-iii) cutting the remaining inner, meat-bearing crab body into quarter sections by cutting through and across said body in the body's main plane from the area in proximity to the leg openings in the body to the opposing leg openings and severing the crab body in a vertical plane about its shorter horizontal center-line;

(b) providing a suction crab picker system, which system comprises -

(b-i) a separate, free-standing meat collecting container;

(b-ii) elongated tubular means associated with said container for conveying the meat from the crab sections to said container;

(b-iii) suction means connected to but separate from said container means comprising a standard, home-type vacuum cleaner, said vacuum cleaner developing between approximately 100–950 mm of water on the suction side of said vacuum cleaner and an air flow rate through said vacuum cleaner in the approximate range of 0.1–1.2 m^3/min.; and

(b-iv) a mechanical, projecting probe attached to the distal, operative end of said tubular conveyance means and extending out away therefrom in the longitudinal direction, said probe being used to physically contact the meat in the body and dislodging and prying the meat for extraction by said suction means through said conveyance means to said container;

(c) applying a suction from said standard, home-type vacuum cleaner through said conveyance means to the exposed meat to suck the meat from the body with the suction of said vacuum cleaner being in the range of approximately 100–950 mm of water on the suction side with an air flow rate through said vacuum cleaner being in the approximate range of 0.1–1.2 m^3/min., and simultaneously loosening the meat by prying and dislodging it loose using said projecting probe to physically contact the meat and move it about;

(d) conveying the loosened, sucked meat to said meat-collecting container pneumatically through said conveyance means; and

(e) exhausting the conveying gas out of said meat-collecting container; whereby the crab meat is relatively easily and quickly removed from the crab body.

4,202,077

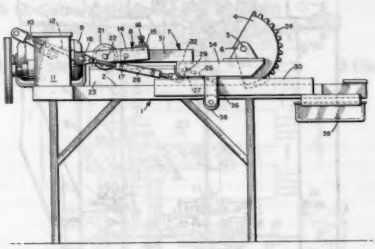
CRAB PEELER

Harry M. Martin, Sr., Rte. 1, P.O. Box 450, Paulina, La. 70763

Filed Jun. 2, 1978, Ser. No. 911,896

Int. Cl.[2] A22C *29/02*

U.S. Cl. 17—73 **5 Claims**



1. A device for recovering crab meat from previously cooked crabs comprising:

a platform for receiving a quantity of crabs, one end of said platform being the peel end, the other end of said platform being the meat end;

means defining a convex surface;

means mounting said convex surface defining means for rolling movement back and forth along the top surface of said platform;

drive means;

means connecting said convex surface mounting means with said drive means;

a scraping blade located between said convex surface defining means and said peel end;

means mounting said blade to cause said blade to move back and forth from a position scraping the rolling surface of said convex surface defining means and a position scraping the top surface of said platform in the direction of said peel end, said blade being in a position scraping the rolling surface of said convex surface defining means when said convex surface defining means is rolling along the top surface of said platform in the direction of said meat end, but being in a position scrap- the top surface of said platform in the direction of said peel end when said convex surface defining means is rolling along the top surface of said platform in the direction of said peel end.

4,202,078

DEPITHER

Frank J. Malinak, Hamilton, Ohio, assignor to The Western States Machine Company, Hamilton, Ohio

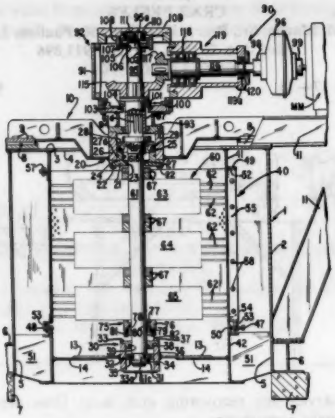
Continuation of Ser. No. 609,186, Sep. 2, 1975, abandoned. This application Sep. 19, 1977, Ser. No. 834,789

Int. Cl.[2] D01B *1/30*; B02C *13/18*

U.S. Cl. 19—26 **13 Claims**

1. Apparatus for depithing fibrous vegetable material comprising: an upright enclosure supported by framework fixed to its base and having an opening in its top for an inflow of said material, a screening wall spaced inside said enclosure and forming the outer boundary of a zone for processing said material, a rigid frame structure supported detachably on the

enclosure top and bridging said opening, a rotary hammer assembly inside said screening wall, said assembly comprising a shaft having an upper end portion thereof extending through said frame structure and a multiplicity of hammers rotatable with said shaft for working material in said zone against said screening wall, means on said upper end portion for supporting said shaft in suspension from said frame structure so that said assembly will hang and tends to align itself in plumb position from said structure by gravity, means including an anti-friction bearing engaging a lower end portion of said shaft and fixing it



in plumbed position relative to said enclosure for holding said lower end portion radially only against displacement relative thereto, and drive means detachably engaged with the upper end of said shaft for rotating said hammer assembly, said drive means and said holding means being substantially free of the weight load of said hammer assembly, said lower end portion being detachable from said holding means so that, with said drive means detached from said shaft and said frame structure detached from said enclosure top, said hammer assembly can be removed and replaced, respectively, simply by lifting and lowering said frame structure.

4,202,079

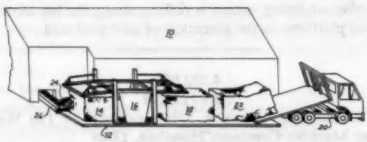
COTTON GIN FEEDING SYSTEM

Jimmy F. Prather, P.O. Box 629, Brownfield, Tex. 79316

Division of Ser. No. 769,919, Feb. 18, 1977, Pat. No. 4,117,571. This application Feb. 21, 1978, Ser. No. 879,609

Int. Cl.[2] D01G *7/00*

U.S. Cl. 19—64.5 **17 Claims**



1. In a cotton gin feeding system having
an elongated slab,
a slab conveyer adjacent the slab, and
a feeder unit mounted for movement on the slab therealong, the feeder unit forming means for feeding seed cotton on the slab onto the conveyer along the slab, THE IMPROVED STRUCTURE COMPRISING:
rick feeder means on each side of the feeder unit for feeding seed cotton on the slab onto the slab conveyer so that the feeder may be advanced in either direction against a rick of cotton on either side of the feeder unit on the slab,
a plurality of wheels on said feeder unit,
the axle of each of said wheels being parallel,
a first travel means for rotating at least one of said wheels in either direction, thereby
propelling the unit in either direction, and
a second travel means for propelling at least one of said wheels in either direction,
said second means for propelling being means for propelling at a substantially higher speed than said first means.

4,202,080

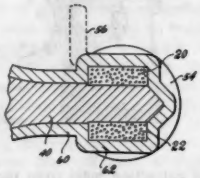
MASS SPECTROMETER FILTER

Robert A. Holzl, La Canada; Frederick P. Pickett, Sierra Madre, and James L. Lawrence, Jr., La Canada, all of Calif., assignors to U.T.I.-Spectrotherm Corporation, Sunnyvale, Calif.

Continuation of Ser. No. 768,173, Feb. 14, 1977, abandoned, which is a division of Ser. No. 612,551, Sep. 11, 1975, abandoned. This application Mar. 30, 1979, Ser. No. 25,568

Int. Cl.[2] H01J *9/14*

U.S. Cl. 29—25.18 **28 Claims**



1. A method for forming a mass filter for use in a mass spectrometer, comprising the steps of:
(a) forming a mandrel having precisely controlled dimensions, including electrode-forming surfaces and insulator positioning surfaces;
(b) polishing the electrode-forming surfaces;
(c) applying an adhesion-reducing coating to the surface of the mandrel;
(d) affixing insulators in contact with the mandrel at the insulator-positioning surfaces;
(e) heating the mandrel and insulators;
(f) reducing gaseous metal halide on the surface of the heated mandrel and insulators, whereby a layer of metal is deposited on the mandrel and insulators, adhering to the insulators and creating electrode surfaces on said electrode forming surfaces;
(g) cooling the mandrel, insulators, and deposited metal, whereby differences in thermal expansion cause release of the deposited metal from the mandrel;
(h) separating from the mandrel the deposited metal which is now bonded to the insulators forming a one-piece, self-supporting structure; and
(i) removing sufficient portions of the deposited metal overlying the insulators to create insulative paths electrically isolating the electrode surfaces created on the electrode forming surfaces.

4,202,081

METHOD OF ASSEMBLING A PRESSURE SENSOR

Samuel A. Johnston, Fontana, Wis., assignor to Borg Instruments, Inc., Delavan, Wis.

Division of Ser. No. 693,436, Jun. 7, 1976, abandoned. This application Mar. 16, 1978, Ser. No. 887,049

Int. Cl.[2] H01G *5/18*

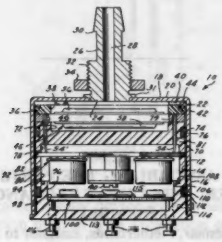
U.S. Cl. 29—25.41 **5 Claims**

1. A method of assembling a pressure sensor comprising the steps of:

securing an aneroid capsule and an electrical circuit electrically connected to the capsule to opposite sides of a first annular insulator;

securing a second annular insulator to the first annular insulator on the aneroid capsule side thereof;

placing the assembly of connected components in an open end of a can which has an opposite closed end having an aperture therein;



applying a vacuum to the aperture to suck the assembly into the can;

connecting electrical leads from the electrical circuit to electrical terminals which extend through a third annular insulator; and

securing the third insulator in the open end of the can.

4,202,082

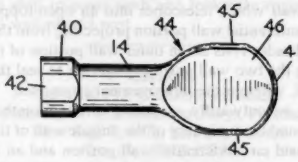
METHOD OF MANUFACTURING SPHERICAL BEARINGS AND PARTS THEREFOR

Gordon T. Williams, Newtown, Conn., assignor to Incom International Inc., Pittsburgh, Pa.

Continuation of Ser. No. 628,027, Nov. 3, 1975, abandoned, which is a continuation of Ser. No. 564,924, Apr. 3, 1975, abandoned, which is a division of Ser. No. 524,388, Nov. 18, 1974, Pat. No. 3,897,616. This application Jul. 24, 1978, Ser. No. 927,201

Int. Cl.[2] B21D *53/10, 53/84*

U.S. Cl. 29—149.5 B **1 Claim**



1. A method of manufacturing a spherical bearing rod end having an outer member, an intermediate member of yieldable material within and supported by said outer member and an inner race operationally supported by said intermediate member comprising preforming a rod end blank having a shank portion at one end thereof and a cylindrical section terminating in a hemispherical section at one other end thereof, flattening the cylindrical section between two punches and self aligning the cylindrical section between the two punches to cold form two enlarged faces, thereby keeping a longitudinal center line of the shank portion equidistant from the faces, said punches are so adapted to flatten the said cylindrical section such that the cylindrical section is compacted and densified in one axis and grows in a radial fashion in the perpendicularly disposed axis therefrom, said hemispherical section grows in a radial fashion to form a smoothly curved outer surface, said outward radial growth of the cylindrical section and hemispherical section form the rod end blank, a cold formed annular area has a controlled outer configuration wherein said rod end blank is provided with an outer surface with a curved section which blends with lesser curved sides or sections, said sides having formed thereon flattened areas wherein said flattened areas have a smooth surface finish, forming a bore partially through said faces thereby leaving a uniformly cold formed annular area to serve as the outer race member, and providing an annular lip at one end of the bore which is integral with the outer race member, inserting in said bore said intermediate member and said inner race member, by abutting one end of the intermediate member against the annular lip, and snapping and interlocking with mechanical interlocking means said intermediate member and inner race member within said bore to effect the bearing support of said inner race member within said intermediate member.

4,202,083

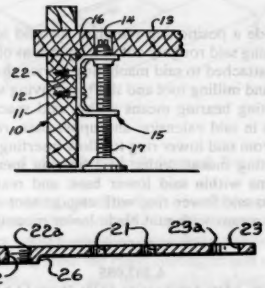
METHOD OF MAKING A FURNITURE LEVELING DEVICE

Kenneth H. Gutner, Highland Park, Ill. 60035

Filed Jun. 12, 1978, Ser. No. 914,396

Int. Cl.[2] B23P *13/00*

U.S. Cl. 29—150 **3 Claims**



1. A method of fabricating a leveling device for a furniture piece comprising stamping a first opening in a generally rectangular metal blank to provide a bore of predetermined diameter, stamping a second opening in said blank to provide a bore in diameter less than said predetermined diameter while extruding said blank thereabout to provide a depending metal throat, threading said second opening to provide at least three threads, shaping said metal blank into a generally C-shape to provide spaced arms containing said openings in aligned relation and installing a threaded bolt in said openings.

4,202,084

MACHINING PROCESS FOR THE IN SITU MOUNTING OF DISPLACEABLE GUIDE BLADES IN A SPIRAL TANK OF A HYDRAULIC MACHINE

Pierre Piguet, Onex, Switzerland, assignor to Ateliers des Charmilles S.A., Geneva, Switzerland

Filed Mar. 14, 1978, Ser. No. 886,397

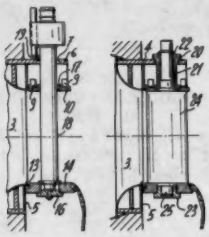
Claims priority, application Switzerland, Mar. 23, 1977, 3639/77

Int. Cl.[2] B23P *15/00, 13/00*

U.S. Cl. 29—156.8 R **1 Claim**

1. A machining process for the in situ mounting of displaceable guide blades in a spiral tank of a hydraulic machine with each said blade including a medial blade having upper and lower mounting ends, comprising the steps of securing spaced-apart upper and lower bases to upper and lower rings of a related annulus of cross-pieces located in the tank, said upper ring including an extension disposed above and spaced from said upper base and extending toward the space in which the rotor of said machine turns, said extension having a roughly

cut hole therein, each of said two bases having a previously machined surface defining a hole therein, positioning said bases parallel to each other with the holes thereof in coaxial alignment with each other as well as with said roughly cut hole by manipulating said lower base relative said upper base, applying a separate centering piece within each of said holes of said spaced-apart upper and lower bases, placing the shaft of a machining device through said aligned roughly cut hole and the holes in said spaced apart upper and lower bases with said shaft engaging said two centering pieces as said centering



pieces provide a positioning template for said machining device, machining said roughly cut hole by means of a boring and milling tool attached to said machining device shaft, removing said boring and milling tool and shaft, removing said centering pieces, inserting bearing means within said spaced-apart machined holes in said extension and upper base, removing said lower base from said lower ring to allow inserting of said blade upper mounting means within said bearing means, inserting bearing means within said lower base, and reattaching said lower base to said lower ring with engagement of said lower base bearing means with said blade lower mounting end.

4,202,085

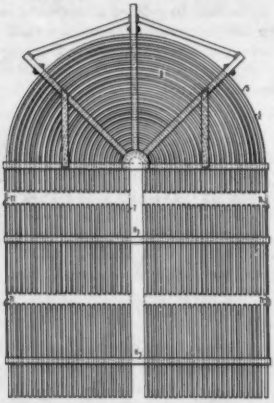
APPARATUS AND METHOD FOR INSTALLING ROWS OF U-SHAPED TUBES IN A HEAT EXCHANGER

Regis R. Vollmer, Penn Township, Allegheny County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 30, 1978, Ser. No. 965,017

Int. Cl.[2] B23P *15/26*

U.S. Cl. 29—157.3 C **11 Claims**



1. A support assembly for aligning and holding at least one row of U-shaped tubes having a U-bend portion and straight legs, said support assembly comprising a U-bend rack which aligns and holds the U-bend portion of at least one row of tubes in the relative positions in which the tubes are to be disposed in the heat exchanger, a plurality of leg racks which align and hold the legs of at least one row of U-shaped tubes in the relative positions in which the legs of the tubes are to be disposed in the heat exchanger, and means attached to said U-bend rack for lifting said support assembly and at least one row of tubes so that the legs of the tubes are generally vertically oriented when the support assembly and rows of tubes are lifted.

4,202,086

METHOD OF ASSEMBLING THE PARTS OF A HEAT EXCHANGER, AND A HEAT EXCHANGER THUS ASSEMBLED

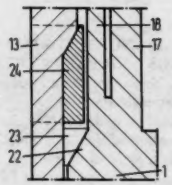
Klaas Buit, Wassenaar, Netherlands, assignor to B.V. Neratoom, The Hague, Netherlands

Filed Aug. 11, 1978, Ser. No. 932,786

Claims priority, application Netherlands, Aug. 17, 1977, 7709088

Int. Cl.[2] B23P *15/26*

U.S. Cl. 29—157.3 R **5 Claims**



1. A method of assembling and sealing a pipe bundle within a shell vessel of a heat exchanger, which includes lowering a pipe bundle sub-assembly having a header at its upper end with an outside wall which telescopes into an open-topped vessel until a circumferential wall portion projecting from the outside wall of the header rests on an outer wall portion of the vessel and welding the two wall portions together to seal the header to the vessel, wherein the improvement comprises:

providing an outwardly extending circumferential projection around the periphery of the outside wall of the header below said circumferential wall portion and an inwardly extending circumferential projection around the inside wall of the vessel, the two projections being positioned so that the inward projection of the vessel is spaced a predetermined distance below the outward projection of the header when said wall portion of the header rests on said wall portion of the vessel so as to form an annular space between said two projections;

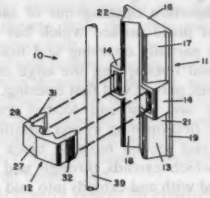
applying a deformable sealing ring around the periphery of the header below said outward projection or around the inside wall of the vessel above said inward projection prior to lowering the pipe bundle fully into the vessel, the sealing ring having a radial thickness less than the distance between the periphery of the header and the inside wall of the vessel to provide clearance for lowering the pipe bundle into the vessel and having a volume substantially equal to the volume of said annular space so that the sealing ring deforms to substantially fill said annular space and to hermetically seal between the header and the vessel when said circumferential wall portion of the header rests on said upstanding wall portion of the vessel.

4,202,087

DEVICE FOR RETAINING SETTING CABLES

Charles L. Wilderman, Grand Island, Nebr., assignor to Kelly Well Company, Inc., Grand Island, Nebr.

Filed Mar. 18, 1977, Ser. No. 778,912
Int. Cl.[2] A44B *21/00*; E21B *17/14*
U.S. Cl. 24—263 R 3 Claims



1. A setting cable retainer device slidably securing alignment cables to a section used in well excavation shafts, the device comprising:

receiver guide means secured to the section, said guide means including a groove formed therein slidably receiving the cable; and

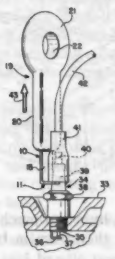
receiver strap means having an outer and an inner surface, said inner surface being generally W-shaped and including a concave passage complimentary to the groove formed in said guide means, the strap means coacting with said receiver guide means slidably securing the cable with the section between said receiver guide means and said retaining strap means, there said receiver guide means including a base element secured to the section and a pair of spaced housings secured to said base element each said housing having a securing means disposed therein for receiving said retaining strap means with the cable disposed between said housings, said base element and said retaining strap means, said securing means being a port formed in said housing and said retaining strap including a body unit means having a pair of spaced prongs projecting therefrom for insertion into said ports, each said port having a locking means formed therein to lock one of said prongs therein, said locking means comprising at least one serrated wall of said port and each said prong having a serrated wall to coact with and lockingly engage said serrated wall of said port.

4,202,088

SPARK PLUG BOOT PULLER

Laird H. Hansen, 407 N. Northwest Hwy., Palatine, Ill. 60067

Filed Sep. 7, 1978, Ser. No. 940,432
Int. Cl.[2] B25B *27/14*
U.S. Cl. 29—280 2 Claims



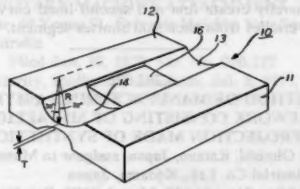
1. A tool for pulling the lead wires from engine spark plugs comprising an L-shaped steel core, said core having a flat base portion with a semi-circular cut-out therein flanked on each side by generally parallel side fingers, said core having a flat shank portion with a plurality of holes therethrough, a flexible plastic electrically insulating handle molded over and around the flat shank portion of the steel core and covering and filling the holes so that there is an interlock between the steel core and the flexible plastic handle, said flexible plastic handle having a shank portion extending beyond and in alignment with the steel core shank and said flexible plastic handle terminating in a flat ring hand engaging portion.

4,202,089

SPLAT-COOLED INSTRUMENT FLEXURE AND METHOD TO FABRICATE SAME

Bo Hans G. Ljung, Wayne, N.J., assignor to The Singer Company, Little Falls, N.J.

Filed Jun. 2, 1978, Ser. No. 912,231
Int. Cl.[2] B22D *11/126*
U.S. Cl. 29—527.6 2 Claims



1. The method of making a high strength flexure comprising the steps of:

heating a source of metal to form a molten material,

placing a quantity of said molten material on a rapidly moving water cooled wheel so as to form a sheet of metallic glass resulting from the rapid cooling of said molten material in contact with said water cooled wheel, and

machining said sheet of metallic glass into flexures having two flat portions connected at each end by a necked down portion of metallic glass material.

4,202,090

LINED CURVILINEAR SUPPORT CRADLE AND A METHOD FOR MANUFACTURING THE SAME

James S. Cook, Friendswood, Tex., assignor to Econotherm Insulation Company, Inc., Houston, Tex.

Filed Mar. 20, 1978, Ser. No. 890,541
Int. Cl.[2] F16L *3/00*
U.S. Cl. 29—417 18 Claims

18. A method for making a lined curvilinear support cradle comprising the steps of:

attaching at least one mounting bracket to a pipe to thereby define a combination;

heating the combination to a temperature between 180° F. and 215° F. to thereby improve its bonding capability;

spinning the heated combination along the longitudinal axis of the pipe within the speed range between 50 and 460 revolutions per minute;

cleaning the inner surface of the spinning pipe to thereby prepare the surface for a primer;

applying to the inner surface of the spinning pipe a layer of urethane primer having a layer thickness of approximately five mils;

heating a polyurethane elastomer to a temperature between 180° F. and 200° F. to thereby improve its fluidity and bondability;

bulk injecting the heated elastomer into the spinning heated pipe to thereby apply on the inner surface of the pipe a centrifugally spin casted coating of the elastomer having a coating thickness between ¼ and ¾ inch;

heating the coating of polyurethane elastomer at a temperature of approximately 215° F. for approximately eighteen hours to thereby cure the elastomer;

transversely dividing the pipe into shorter segments of pipe; and

dividing the pipe along its longitudinal axis into two pieces to thereby create first and second lined curvilinear support cradles from each said shorter segment.

4,202,091

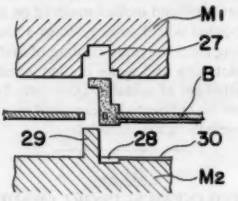
METHOD OF MANUFACTURING A HYBRID FRAMEWORK CONSISTING OF METALLIC PLATE AND PROJECTION MADE OF SYNTHETIC RESIN

Masanori Ohnishi, Katano, Japan, assignor to Matsushita Electric Industrial Co. Ltd., Kodama, Japan

Division of Ser. No. 664,037, Mar. 4, 1976, Pat. No. 4,075,395. This application Nov. 29, 1977, Ser. No. 855,907

Int. Cl.[2] **B22D** *11/126*; **B32B** *9/04*

U.S. Cl. 29—527.1 **1 Claim**



1. A method of manufacturing a hybrid framework assembly for use in electrical or mechanical devices as a substratum for supporting and actuating various components incorporated in said devices, said hybrid framework assembly including a base plate having therein at least one first opening, and at least one projection mounted on said base plate and made of synthetic resin and having the base thereof attached to one surface of said base plate and having a cross-section larger than said first opening and projecting from said one surface of said base plate over said first opening, said projection having a constricted portion which is integral with said projection and extending from said base through said first opening, and a mass of synthetic resin integral with the end of the constricted portion and tightly engaged with the surface of said base plate and at least partially covering said first opening for tightly holding said projection on said base plate, said manufacturing method comprising the steps of:

(a) forming said first opening in said base plate;

(b) forming in said base plate a second opening adjacent said first opening;

(c) placing against said one surface of said base a first molding block having a plane surface and at least one first recess formed in said plane surface, said first recess having a configuration for molding said projection and having an aperture opening out of said first recess through said plane surface which has a cross-sectional area larger than that of said first opening in said base plate, said first molding block being placed at a position to cover said first opening with said aperture of said first recess;

(d) at least a portion of said first recess a being aligned with said second opening;

(e) placing against the other surface of said base a second molding block having a plane surface with at least one second recess formed in said plane surface, said second recess having a configuration for molding said mass and having an aperture opening out of said second recess through said plane surface which has a cross-sectional area at least partially covering said first opening in said base plate and overlapping the edge of said base plate around at least part of said first opening, thereby forming a cavity by said first and second recesses extending through said first opening in said metallic base plate;

(f) providing said second molding block with a molding projection which extends through said second opening and is aligned with and extends into said first recess when said molding blocks are against said base plate, said molding projection having a cross-sectional shape for leaving a space between said molding projection and the edge of said second opening around the periphery of said opening;

(g) injecting molten synthetic resin from a cavity gate in at least one of said molding blocks into said first and second recesses and also in said openings in said base plate for entirely filling the cavity with said molten synthetic resin for forming said projection and integrally forming within said second opening, adjacent to said projection, a frame member of synthetic resin having a hole therein; and

(h) removing said first and second molding blocks from said base plate, leaving said projection firmly fixed on said base plate.

4,202,092

AUTOMATIC PART INSERTION MACHINE

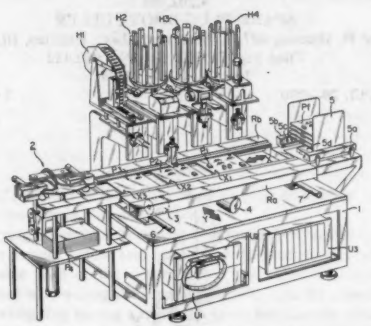
Hatsuhiko Shibasaki; Junishi Omura, both of Ibaraki; Tetsuo Tanabe, Nagaokakyo, and Kazumi Takamori, Takatsuki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 833,569, Sep. 15, 1977, abandoned. This application Jan. 24, 1979, Ser. No. 6,202

Claims priority, application Japan, Sep. 17, 1976, 51-112354; Sep. 17, 1976, 51-112355; Sep. 17, 1976, 51-112356; Sep. 17, 1976, 51-112357; Sep. 17, 1976, 51-112358; Sep. 17, 1976, 51-112359

Int. Cl.[2] **H05K** *3/30, 13/04*

U.S. Cl. 29—741 **10 Claims**



1. An automatic part insertion machine, for inserting parts having leads extending therefrom in holes of printed circuit boards comprising:

(a) a pair of parallel conveyor rails so arranged as to support a plurality of printed circuit boards in one row extending in a lengthwise direction,

(b) a first control means for simultaneously displacing said

pair of parallel conveyor rails in a direction transverse to said lengthwise direction,

(c) a second control means for simultaneously displacing said plurality of printed circuit boards in the lengthwise direction,

(d) a device for feeding one by one printed circuit boards upon which are to be mounted electric parts onto said pair of parallel conveyor rails from one end thereof,

(e) a device for stacking one by one the printed circuit boards fed thereto from the other end of said pair of parellel conveyor rails,

(f) a plurality of part feeding devices arranged in one row in said lengthwise direction along one side of said pair of parallel conveyor rails for feeding different types of parts to respective printed circuit boards on said pair of parallel conveyor belts and inserting the leads of said fed parts into corresponding predetermined insertion holes of said printed circuit boards, and

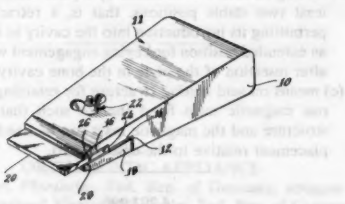
(g) a numerical control system for controlling said first and second control means so as to cause said plurality of printed circuit boards to move along said pair of parallel conveyor rails and to stop when one of said plurality of printed circuit boards is adjacent a specified part feeding device, thereby positioning said one printed circuit board with respect to said specified part feeding device and to actuate said specified part feeding device to cause the leads of a corresponding part to be inserted into predetermined holes of said one printed circuit board.

4,202,093

LOW COST, RENEWABLE SCRAPING IMPLEMENT

Martin A. Wallerstein, 29 Oakwood Ave., Norwalk, Conn. 06851

Filed Mar. 13, 1978, Ser. No. 885,885
Int. Cl.² A47L *13/08*
U.S. Cl. 30—169 **3 Claims**



1. A hand held renewable scraping implement comprising:

a unitary, wedge shaped handle member having a pair of opposed sides converging toward each other at one end thereof, the opposite end of said sides being joined together to form an essentially flat working surface,

said handle member including first and second recessed areas therein adjacent said one end of said handle member,

said first recessed area extending deeper into said handle member than said second recessed area and extending the entire length of one edge of said handle member,

said first recessed area including a first abutment wall opposing said one edge and extending essentially parallel to the latter,

said second recessed area being disposed between said working surface and said first recessed area and adjacent the latter, said second recessed area extending to one of said opposed sides of said handle member and including a second abutment wall opposing said one edge and extending parallel to the latter;

a retaining member adapted to be received within said second recessed area and extending between the latter and said one edge of said handle member in overlaying opposed relationship to each of said recessed areas,

said handle member and said retaining member including aligned openings therein;

a polygonal scraping element comprising a sheet of glass having a plurality of scraping edges, said scraping element being received within said first recessed area between said handle member and said retaining member with one of said scraping edges thereof being disposed beyond said one edge of said handle member and extending in a direction essentially parallel with said working surface, and another of said scraping edges in abutment with said first abutment wall along essentially the entire length of the latter;

first and second resilient pads respectively interposed between said scraping element and said handle member, and between said scraping element and said retaining member; and

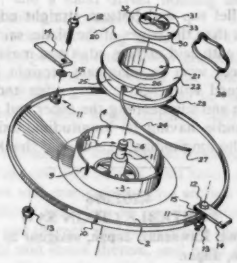
releasable securing means extending through said aligned openings in said handle member and said retaining member to urge the latter toward the former whereby to clamp said scraping element.

4,202,094

ROTARY MACHINE ATTACHMENT

Irene Kalmar, 49 Young St., Sylvania Heights, New South Wales 2224, Australia

Filed Jun. 28, 1978, Ser. No. 920,127
Claims priority, application Australia, Jul. 5, 1977, PD0711
Int. Cl.² B26B *27/00*; A01D *55/18*
U.S. Cl. 30—276 **5 Claims**



1. A grass cutting attachment for a rotary machine, said attachment comprising a shaft adapted at one end thereof to be rotated by said rotary machine; a cup shaped body coaxial with said shaft and secured thereto intermediate the ends thereof; said body having an interior cylindrical flange coaxial with said shaft and defining an annular cavity adjacent the other end of said shaft, said flange having a V-shape slit therein substantially parallel to said shaft and said body having an aperture therein at its periphery; a bobbin comprising a reel having a central tube with two parallel annular discs located one at each end of said tube, said reel being located within said annular cavity; means to secure said bobbin to said shaft; a length of filament having a portion thereof wound around said tube between said discs; and a flexible cover strip having an opening therein and wound around said filament portion located on said tube; the remainder of said filament passing through said opening, being clamped in said V-shaped slit and passing through said aperture whereby one end of said filament extends radially away from said shaft under the action of a centrifugal force created by said rotation.

4,202,095

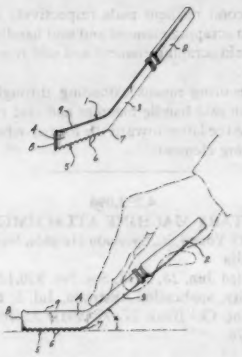
STEAK KNIFE

Hilaire Gingras, C.P. 1328 475 Cote Joyeuse, Saint-Raymond, Cte Portneuf, Quebec, Canada (G0A 4G0)

Filed Dec. 7, 1977, Ser. No. 858,781
Int. Cl.² B25G *1/00*
U.S. Cl. 30—340 **1 Claim**

1. A steak knife for table use comprising a single-piece blade

and shank, made of flat stock, said blade being elongated, having a blunt outer end, an inner end joined to the inner end of said shank, a substantially straight top edge and a substantially straight bottom cutting edge, said straight top edge and said bottom cutting edge being substantially parallel to each other, the cutting edge being provided with serrations throughout its length and extending from the outer end to the inner end of said blade, said shank being elongated with substantially parallel top and bottom straight edges which are closer together than the edges of the blade, said shank bottom edge merging with said cutting edge and making an angle of about 40 degrees with an imaginary straight line projecting from, and aligned with, said cutting edge and an elongated handle fixed to and surrounding the outer end portion of said shank, said handle having its longitudinal axis substantially co-axial with the longitudinal axis of said shank.

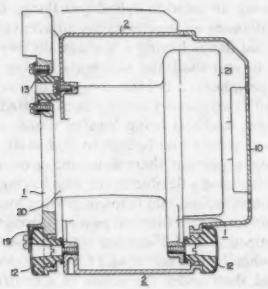


4,202,096

PORTABLE CHAIN SAW

Akira Nagashima, Kawasaki, Japan, assignor to Kioritz Corporation, Tokyo, Japan

Filed Sep. 8, 1978, Ser. No. 940,684
Claims priority, application Japan, Apr. 24, 1978, 53-48480
Int. Cl.[2] B27B *17/00*
U.S. Cl. 30—381 **2 Claims**



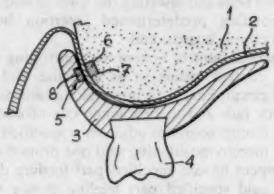
1. A portable chain saw comprising a drive-part assembly including an engine, a saw chain and the like, and a rear handle, and hollow, tubular, resilient members connecting said assemblies to each other, wherein the improvement resides in an arrangement with said resilient members being threadably connected to a side of said drive-part assembly in cantilever fashion through screws penetrating hollow portions of the resilient members, with said supporting assembly being fitted and held in place on the outer peripheries of tubular portions of said resilient members in a manner exposing one side of said supporting assembly, and with a side cover supporting a recoil starter fitted to said one side of said supporting member unitarily with the supporting assembly.

4,202,097

PROCESS AND DEVICE FOR RETAINING A PROSTHETIC ELEMENT ON AN OSSEOUS PART

Jean-Antoine Erlich-Deguemp, 20 rue de Vintimille, 75009 Paris, France

Filed Feb. 28, 1977, Ser. No. 772,999
Claims priority, application France, Feb. 27, 1976, 76 05598
Int. Cl.[2] A61C *13/00*
U.S. Cl. 433—189 **18 Claims**



1. An improved magnetic prosthesis-retaining device adapted for implantation in a cavity formed in an osseous part for retaining a prosthetic member having a magnetic element, the device comprising:

(a) at least one magnetic mass;

(b) a seating structure including keying means engageable with the wall of the cavity for firmly securing the magnetic mass seating structure fast to the osseous part, said seating structure constituted by a plate element having at least two stable positions, that is, a retracted position permitting its introduction into the cavity in the bone and an extended position for keying engagement with the bone after insertion of the plate in the bone cavity; and

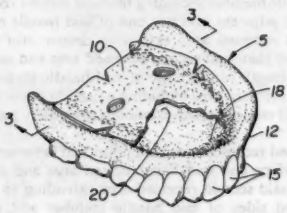
(c) means on said seating structure for retaining the at least one magnetic mass fixed thereto such that the sealing structure and the magnetic mass can be fixed against displacement relative to the osseous part.

4,202,098

DENTAL PLATE CUSHION

Leonard Russo, 177 Canal St., San Rafael, Calif. 94901

Filed Feb. 12, 1979, Ser. No. 11,256
Int. Cl.[2] A61C *13/00*
U.S. Cl. 433—168 **11 Claims**



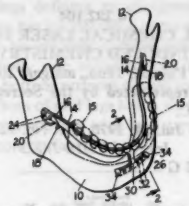
1. A denture cushion consisting essentially of moistened cellulose filter sheet material, inserted onto a mouth confronting portion of the denture, whereby when the wearer inserts the denture, with filter sheet material so placed, in his mouth and bites down to seat the dentures on his gums, the cellulose compresses and through suction causes the denture to adhere in its seated position on said gums and eliminates the need for conventional denture adhesives.

4,202,099

DENTURE SUPPORT FRAME

Ralph Roberts, 920 Rio Dell Ave., Rio Dell, Calif. 95562

Filed Sep. 5, 1978, Ser. No. 939,122
Int. Cl.[2] A61C *13/00*
U.S. Cl. 433—176 5 Claims



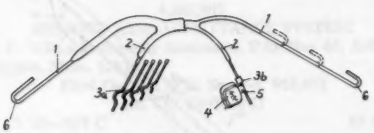
1. A denture support frame for lower dentures comprising
(a) a rigid bar arranged removably to support an artificial denture thereon,
(b) said bar having front and rear portions and being curved to the shape of the lower jaw bone,
(c) said bar having rear ramus implant portions,
(d) and front support means on said bar arranged for engagement with the jaw bone,
(e) each of said ramus implant portions comprising a tip end,
(f) at least one of said ramus implant portions at said tip end including a laterally extending flattened portion arranged to be inserted in a correspondingly sized lateral opening cut in the ramus portion of the jaw bone.

4,202,100

ORTHODONTIC APPLIANCE

Rolf Förster, Pforzheim, Fed. Rep. of Germany, assignor to Firma Bernhard Förster, Pforzheim, Fed. Rep. of Germany

Filed Oct. 21, 1977, Ser. No. 844,379
Claims priority, application Fed. Rep. of Germany, Oct. 28, 1976, 2648990; Oct. 5, 1977, 2744740
Int. Cl.[2] A61C *7/00*
U.S. Cl. 433—7 22 Claims



1. An orthodontic appliance for exerting a correcting force on at least one tooth of a patient, comprising an oral elongated inner arch, at least one tooth connecting sleeve adapted to be connected to a tooth of a patient and forming a guide for said inner arch, and
at least one clamping sleeve which resiliently clamps itself on said inner arch, and engages said tooth connecting sleeve, said clamping sleeve having a radially inwardly tapering longitudinal slot, which is adapted to receive an implement, which implement is operable to widen said slot, so that said clamping sleeve is slidable along said inner arch.

4,202,101

DENTAL ANCHOR AND A PLASTIC SHANK FOR HOLDING SAME

Bernard Weissman, New York, N.Y., assignor to Ipco Hospital Supply Corporation, White Plains, N.Y.

Filed Mar. 16, 1978, Ser. No. 887,173
Int. Cl.[2] A61K *5/02*
U.S. Cl. 433—225 30 Claims

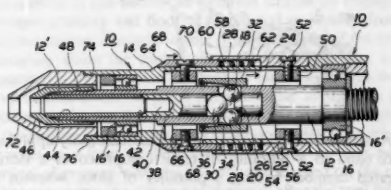
16. A combination of a dental anchor, a shank holding said dental anchor, and a hand driver holding and turning said shank, said combination comprising:
said dental anchor including at least one threaded section and one manipulating end section disposed along a longitudinal axis of said dental anchor and joined together by a frangible reduced thickness portion so that said sections can be severed after being threaded into a channel in a tooth;
said shank including a longitudinal opening extending inwardly from one end thereof, said shank opening receiving at least said manipulating end section therein;
said hand driver including an opening extending inwardly from one end thereof, said hand driver receiving an opposite end of said shank therein, said hand driver including first means for rotating said shank and second means for releasably retaining said shank within said hand driver with said second means permitting a pivotal relationship between said shank and said hand driver when said dental anchor is being threaded into the channel in the tooth; and
said hand driver being fabricated from a plastic material.

4,202,102

DEVICE FOR OPENING AND CLOSING A CHUCK FOR A DENTAL HANDPIECE

Takasuke Nakanishi, Kanuma, Japan, assignor to Nakanishi Dental Mfg., Co., Ltd., Tochigi, Japan

Filed May 12, 1978, Ser. No. 905,397
Claims priority, application Japan, May 12, 1977, 52-54932
Int. Cl.[2] A61C *9/00*
U.S. Cl. 433—127 3 Claims



1. A device for opening and closing a chuck for a dental handpiece comprising: a housing having a conically tapering

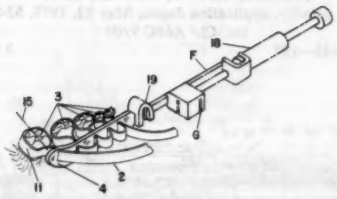
end portion; an output shaft journalled for rotation in said housing, said output shaft having a hollow axial portion therein and a plurality of openings formed at equally spaced portions around said output shaft; a truncated cone-shaped column positioned in the innermost end of said hollow portion, said column having a diameter equal to that of said hollow portion, and a length extending from the innermost end of said hollow portion to said openings in said output shaft; a plurality of driving balls, each rotatably positioned in one of said openings in said output shaft; a driven ball rotatably positioned in said hollow portion of said output shaft to abut against said driving balls such that a portion of each of said driving balls protrudes from its corresponding opening; a ball pushing sleeve mounted for axial displacement on said output shaft, said sleeve having an outwardly tapering inner periphery and a means around said periphery adjacent to an outer orifice thereof to prevent disengagement from said output shaft, said tapering inner periphery contacting said driving balls; a cylindrical pusher slidably positioned in said hollow portion of said output shaft to abut against said driven ball, said pusher including a cylindrical hollow and also a tapering orifice; a chuck mounted in said hollow portion of said output shaft for displacement axially within said hollow portion and abutting against said cylindrical pusher; a cap mounted around the outermost end of said output shaft; a rear control sleeve means mounted on said housing for axial displacement thereon, said rear sleeve means including first lugs positioned within said housing for contacting one end of said ball pushing sleeve upon the displacement of said rear control sleeve means in a first direction; a front control sleeve means mounted on said housing for axial displacement thereon, said front control sleeve means including second lugs positioned within said housing for contacting the other end of said ball pushing sleeve upon displacement of said front control sleeve means in a second direction opposite to said first direction; and spring means positioned between said rear and front control sleeve means for biasing said rear control sleeve means in said second direction and for biasing said front control sleeve means in said first direction; wherein the movement of said front and rear control sleeve means causes said first and second lugs to engage corresponding ends of said pushing sleeve and thereby move said pushing sleeve in said first and second directions, thereby moving said driven balls into and out of said holes in said output shaft whereby said driven ball is moved axially in said hollow portion of said output shaft, thereby opening and closing said chuck.

4,202,103

MATRIX BAND GUIDE AND MATRIX RETAINER DEVICE

Michael E. Zall, Two Yorkshire Dr., Suffern, N.Y. 10901, and Stephen Silverhardt, 1436 Marshall La., Meadowbrook, Pa. 19046

Filed Feb. 24, 1977, Ser. No. 771,616
Int. Cl.² A61C 5/12
U.S. Cl. 433—153 **29 Claims**



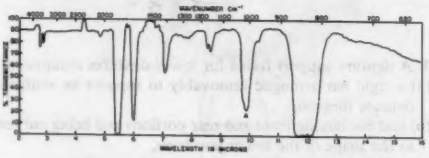
1. A matrix band guide for use in simultaneously applying a matrix band to a plurality of teeth comprised of a flexible elongated member having a plurality of slots, wherein the elongated member is of sufficient length and sufficient width to allow placement of the guide against the teeth and to guide the matrix band around the teeth, and wherein the slots extend a major portion of the width of the member and are of a width, height and spacing sufficient to permit the looping of the matrix band through the slots to form a plurality of loops for binding engagement with the teeth, whereby when the matrix band is drawn into binding engagement with the teeth the elongated member and the matrix band substantially conform to the taper and curvature of the teeth.

4,202,104

HCL OR DCL CHEMICAL LASER USING LASER INDUCED CHEMISTRY

James A. Merritt, Pulaski, Tenn., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 24, 1978, Ser. No. 927,324
Int. Cl.² H01S 3/223
U.S. Cl. 331—94.5 G **3 Claims**



1. A method for the production of nascent chlorine by irradiating $COCl_2$ in admixture with H_2/D_2 to produce HCl or DCl in an excited vibrational state which lases, said method comprising:

(i) preparing a homogeneous admixture of $COCl_2$ and H_2/D_2;

(ii) metering said admixture of $COCl_2$ and H_2/D_2 into a properly conditioned laser cell to achieve a predetermined pressure from about 25 to about 200 torr; and

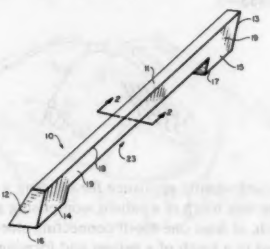
(iii) irradiating said admixture of $COCl_2$ and H_2/D_2 for a predetermined time period with the P_{54} line of a cw CO_2 multiline laser operating at a predetermined power level to effect dissociation of $COCl_2$ to produce nascent chlorine atoms which immediately react with H_2/D_2 present to produce HCL or DCl in an excited vibrational state which lases.

4,202,105

BRUSH GUIDE

Kenneth A. Hogle, 15 Golden Ct., Cromwell, Conn. 06416

Filed Dec. 26, 1978, Ser. No. 972,999
Int. Cl.² B43L 7/00; A46B 17/00
U.S. Cl. 33—483 **7 Claims**



1. A device for guiding a brush to provide for the painting of a continuous line comprising:

an elongated body, said body having a trapezoidal cross-sectional shape with parallel top and bottom surfaces and a pair of flat side surfaces interconnecting said top and bottom surfaces, said body top surface having a smaller area than said body bottom surface, a first continuous

linear edge of said top surface defining a brush guide, a first of said body side surfaces extending from said first edge to a first edge of said body bottom surface, said first side and bottom surfaces meeting at an angle of greater than 90° whereby said top surface first edge is vertically offset from said bottom surface first edge; and

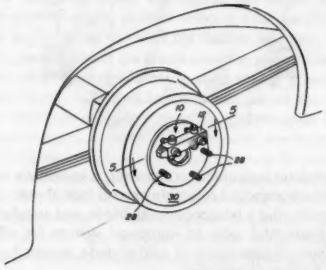
a pair of spaced apart legs extending from said body bottom surface, said legs defining an elongated space therebetween, said legs having the same cross-sectional shape as said body and having side surfaces which define extensions of said body side surfaces, said device being supported on flat bottom surfaces of said legs and first edges of bottom surfaces of said legs being vertically offset from said body top surface first edge by a greater distance than said body bottom surface first edge.

4,202,106

BOLT PATTERN GAUGE

James D. Olson, 831 Island Way, Clearwater, Fla. 33515

Filed Jan. 3, 1979, Ser. No. 788
Int. Cl.² G01B *3/30, 3/48*
U.S. Cl. 33—168 R **10 Claims**



1. A bolt pattern gauge for accurately determining the distance between adjacent mounting holes on a vehicular wheel or adjacent studs on a hub of a vehicle, said gauge comprising an elongated body having a pair of laterally protruding extensions spaced longitudinally along said body, said extensions being adapted to engage adjacent wheel mounting studs on a vehicle and adapted to engage adjacent mounting holes on a vehicular wheel, each of said extensions including a free end insertable into one of said mounting holes and a hollowed interior for disposition over one of said studs.

4,202,107

REMOTE AXIS ADMITTANCE SYSTEM

Paul C. Watson, Assembly Associates, P.O. Box 45, Arlington Heights, Mass. 02175

Filed Oct. 23, 1978, Ser. No. 953,492
Int. Cl.² G01B *5/25*
U.S. Cl. 33—169 C **12 Claims**

1. A remote axis admittance system comprising,

a first support means for receiving an actuating force,

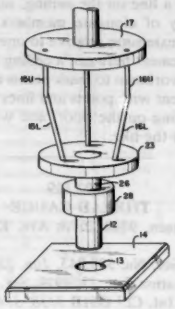
compliance means secured to said first support means and having a first portion defining a translation region and a second portion defining a rotation region,

said first and second portions being contiguous,

a second support means coupled to said first support means by said compliance means for supporting part gripping means,

and part gripping means carried by said second support member,

said translation region responding to a force developed about a compliance center or axis embraced by said part gripping means by deflecting in a direction producing translation of said part gripping means and said rotation



region responding to a moment by producing rotation about said compliance center or axis.

4,202,108

APPARATUS AND METHOD FOR MARKING POINTS AND LINES DURING BUILDING CONSTRUCTION

Daniel Adams, Jr., 812 N. Herman St., and Chester W. Craig, Sr., 504 Vann St., both of Goldsboro, N.C. 27530

Filed Aug. 4, 1978, Ser. No. 931,391
Int. Cl.² G01B *3/08*
U.S. Cl. 33—189 **17 Claims**

1. An apparatus for marking points and lines on a ceiling surface, comprising: a first layout tool having a plurality of elongate members adjustably secured together for axial extension relative to one another to different lengths for engagement between a ceiling and floor; a plumb rod suspended from the tool and having a pointer visible from externally of the tool for indicating when the tool is vertical in a first plane; a level mounted on the outside of the tool for indicating when the tool is vertical in a second plane perpendicular to the first plane; pointers at the top and bottom ends of the tool, for alignment of the pointer at the bottom end of the tool with an existing line or point on a floor of the building, whereby another point in vertical alignment with the line may be marked on the ceiling at the pointer on the top end of the tool, after the tool has been made vertical in both planes; chalk line holding means on the top end of the layout tool for holding one end of a chalk line in alignment with the pointer at the top of the tool; a chalk line

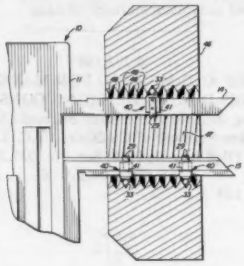
carried by the layout tool and held by the chalk line holding means; and a second tool for holding the other end of the chalk line, whereby the chalk line may be stretched taut between the tools for marking a line on the ceiling, said second tool comprising a plurality of elongate members adjustably secured together for axial extension relative to one another to different lengths for engagement between a ceiling and floor, said tools enabling a single workman to mark points and lines on a ceiling in vertical alignment with points and lines on a floor while the workman is standing on the floor, and without requiring the use of ladders and the like.

4,202,109

THREAD GAUGE

Thomas C. Schasteen, 9305 205th Ave. East, Sumner, Wash. 98390

Continuation of Ser. No. 589,043, Jun. 23, 1975, abandoned.
This application Jan. 23, 1978, Ser. No. 871,241
Int. Cl.[2] G01B *3/38, 3/40*
U.S. Cl. 33—199 R **3 Claims**



1. In a thread gauging device for measuring the pitch diameter of helical threads and for self-alignment with the pitch of said threads:

(a) a caliper including

(i) a frame,

(ii) a fixed blade element extending from said frame,

(iii) a movable blade element carried by said frame and parallel to said fixed blade element and movable relative thereto while maintaining said parallel relation, and

(iv) a scale for indicating the degree of separation between said blade elements;

(b) a pair of thread gauge attachments carried by one of said blade elements in longitudinally spaced relation along that blade element;

(c) a single thread gauge attachment carried by the other of said blade elements substantially at the middle of a longitudinal extent corresponding to the spacing of said thread gauges attached to the other of said blade elements;

(d) a base element included in each thread gauge attachment and in sliding engagement with the blade element associated therewith;

(e) each of said base elements being formed with a groove which slidably receives one of said blade elements;

(f) spring means on each of said base elements cooperating with the blade on which that base element is mounted to maintain that base element in sliding relation to the blade element; and

(g) a contact member carried by each of said base elements and receivable in thread grooves;

(h) said base elements being reversably positionable on said blade elements such that a pair said contacts on one blade element and one of said contacts on the other blade element may alternatively face toward or away from each,

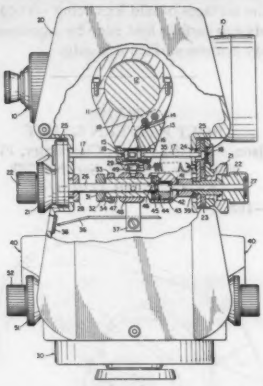
the contact members of the pair of base elements on one thread gauge attachment being engaged with thread grooves in spaced relation with respect to the contact member in the other of said thread gauge attachments which is received in a thread groove between the thread grooves engaged by the pair of contact members on the other of said thread gauge attachments.

4,202,110

THEODOLITE TANGENT SCREW SYSTEM

J. Peter E. Kooi, Succasunna, N.J., assignor to Keuffel & Esser Company, Morristown, N.J.

Filed May 18, 1979, Ser. No. 40,365
Int. Cl.[2] G01C *1/00*
U.S. Cl. 33—299 **9 Claims**



1. In a geodetic instrument comprising a stationary base, an enclosed alidade standard rotatable on said base about a central vertical spindle, and a telescope rotatable in said standard on a transverse horizontal axle, an improved system for effecting precise, minute displacement of said alidade standard or telescope, said system comprising:

(a) an arm member associated with said spindle or axle and extending therefrom in a direction transverse to the axis of said spindle or axle, said arm member being arranged to normally pivot freely about said axis;

(b) locking means associated with said arm member for effecting firm engagement between said arm member and said spindle or axle;

(c) means communicating between said locking means and the exterior of said alidade standard for transmitting operating force to said locking means;

(d) a shaft member supported for rotation in said alidade standard and extending in a direction transverse to said axis and said arm member, said shaft member being situated proximate the distal end of said arm member and having at least one of its ends communicating with the exterior of said alidade standard;

(e) externally threaded advancing means encompassing said shaft member in the zone proximate said arm member and being arranged for rotation therewith;

(f) drive means threadedly engaging said advancing means and being displacable axially of said shaft member upon rotation of said advancing means;

(g) means linking said drive means with said arm member distal end to thereby transfer said drive means displacement to said arm member and effect pivotal displacement of said arm member and engaged spindle or axle about the axis thereof;

(h) a first control member affixed to said communicating end of said shaft member whereby rotary motion may be imparted to said shaft member; and

(i) a second control member arranged coaxially with said first control member and engaging said means communicating with said locking means whereby operating force may be applied for transmission to said locking means.

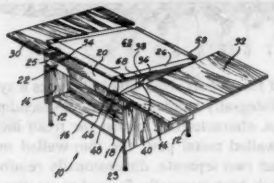
4,202,111
DRAFTING APPARATUS

Peter V. Bachley, 473 St. Helene St., Apt. 211, Longueuil, Quebec, Canada

Continuation-in-part of Ser. No. 696,386, Jun. 15, 1976, abandoned, which is a continuation-in-part of Ser. No. 599,966, Jul. 29, 1975, abandoned. This application Nov. 11, 1977, Ser. No. 850,677

Int. Cl.² B43L *13/02*

U.S. Cl. 33—444 **1 Claim**



1. A drafting table comprising a flat board and a flexible member travelling about the board, the board having two straight parallel edges, an idler roller at each parallel edge and at right angles to the travel of the flexible member, the flexible member passing about the board over the idler rollers and kept taut, the flexible member being such that a drawing can be fastened thereto and can be conveyed about the board, the flexible member including parallel, spaced-apart end edges, and spaced-apart, parallel elastic tension members extending between the end edges at right angles thereto for tensioning the flexible members, wherein the resilient tension members apply tension over different longitudinal areas of the flexible member, compensating for the different conditions affecting the flexible member, the tension members being spaced further apart near the center of the flexible member than they are near the longitudinal edges thereof, a plurality of additional idler rollers below the board and parallel with the idler rollers at the edges of the board, the flexible member being threaded through the additional rollers whereby additional drawing surface area is provided by the flexible member.

4,202,112
PROCESS FOR THE UNIFORM DYEING OF TEXTILE MATERIAL WEBS WITH THE AID OF A UNIFORM PRE-DRYING

Hans-Ulrich von der Eltz, Frankfurt am Main, and Siegfried Glander, Bad Soden am Taunus, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

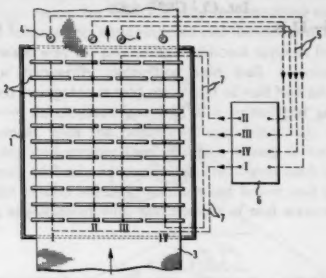
Filed Dec. 8, 1977, Ser. No. 858,897

Claims priority, application Fed. Rep. of Germany, Dec. 10, 1976, 2655972

Int. Cl.² F26B *3/28*

U.S. Cl. 34—4 **9 Claims**

1. A process for the uniform pre-drying of damp textile material webs in an infrared pre-drying tunnel, subsequent to a continuous wet treatment operation in the dyeing or finishing of fiber materials, including: measuring a moisture content remaining on said textile material web, wherein, in the course of a material run, immediately following an infrared pre-drying tunnel for the continuously fed material, several measuring positions are arranged transversely to the transport direction of said material; determining the residual moisture at these positions on said textile material web, by means of a contactless method, whereby measuring values in form of pulses are obtained; transmitting said measuring pulses with low inertia to a control element of the preceeding pre-dryer; and controlling the heating power of several separately controllable heating fields, distributed across the width of said drying tunnel, said



controlling being in a correspondent relationship with measured values of the moisture obtained at a measuring position.

4,202,113
PAPER MACHINE DRYING SECTION AND METHOD FOR OPERATING SAME

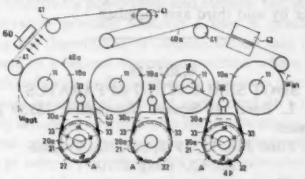
Matti Kankaanpaa, Espoo, Finland, assignor to Valmet Oy, Finland

Filed Apr. 3, 1978, Ser. No. 892,961

Claims priority, application Finland, Apr. 4, 1977, 771056

Int. Cl.² F26B *3/24*

U.S. Cl. 34—23 **16 Claims**



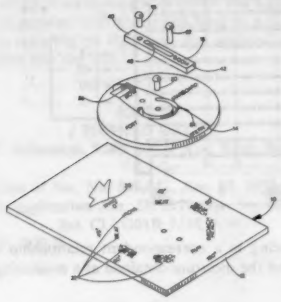
1. In a method for operating a paper machine drying section having drying cylinders arranged in two horizontal main rows, with said drying cylinders including at least one cylinder group equipped with a drying fabric means forming a loop and lapping the drying cylinders of said cylinder group in zig-zag fashion so that the cylinders of one row are outer cylinders situated outside and the cylinders of the other row are inner cylinders situated inside said loop, and for drying a continuous fibrous web travelling together with and supported by said fabric means at said one cylinder group, said fibrous web during its travel along said cylinder group having portions in direct contact with the outer cylinders and portions separated from the inner cylinders by said fabric means, said inner cylinders being formed with outwardly opening voids in their outer surfaces, said outer surfaces being non-perforated, the step of creating in said voids by suction means applied externally to said inner cylinders a pressure lower than the pressure at the outer surface of the portions of said web travelling along said inner cylinders while separated therefrom by said fabric means, thus providing a pressure differential urging said web against said drying fabric means at said inner cylinders to prevent detachment of said web from said drying fabric means.

4,202,114

SAILING TRAINING DEVICE

Steven Berson, 25 Marsh St., Newport, R.I. 02840

Filed May 8, 1978, Ser. No. 903,534
Int. Cl.[2] G09B *9/06*
U.S. Cl. 35—11 A 7 Claims



1. In a teaching aid for teaching individuals to sail sailboats the combination comprising:

first, second, and third planar members;

said first planar member depicting the wind direction near the surface of the water;

said second planar member representing the bow of a sailboat;

said third planar member formed to represent the boom of a sailboat;

first, second, and third axis members;

said first axis member interconnecting said second and third planar members;

said second axis member interconnecting said first and second planar members for mutual rotation;

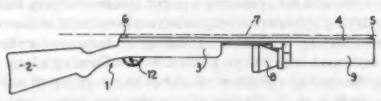
said first planar member interconnected to said third planar member by said third axis member.

4,202,115

SHOT SIMULATING APPARATUS

Jacques M. L. Borel, 10 Square Raynouard, 78150 Rocquencourt, France

Filed Jun. 12, 1978, Ser. No. 914,686
Int. Cl.[2] F41F *27/00*
U.S. Cl. 35—25 9 Claims



1. A portable apparatus for simulating a shot with a fire-arm, in particular a shot with a rifle, comprising a support having a butt, an image recording apparatus, such as a camera providing an immediate development of the prints or the like, secured to the support having a butt, a trigger, means defining a line of sight, a magnifying optical device having an optical axis which is substantially parallel to the line of sight with a very small parallax, means for forming an image of cross-wires on the recorded image, actuating and connecting delay means connecting the trigger to the recording apparatus, said delay means being adjustable and the delay produced being substantially equal to the time which elapses in a real fire-arm between the moment the striker strikes against the detonator of the charge and the moment when the charge issues from the mouth of the barrel of the fire-arm.

4,202,116

SPORT SHOE TREAD

Armin A. Dassler, Ringstrasse 121, D-8522 Herzogenaurach, Fed. Rep. of Germany

Filed Sep. 12, 1978, Ser. No. 941,589
Claims priority, application Fed. Rep. of Germany, Sep. 12, 1977, 7728190[U]
Int. Cl.[2] A43B *23/28;* A43C *15/02*
U.S. Cl. 36—59 R 5 Claims

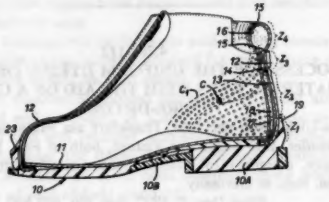
1. A tread for a sport shoe which includes a synthetic resin sole having integrally molded projections extending out from a tread surface, characterized in that the tread includes a one-piece, thin-walled metal part, the thin-walled metal part includes at least two separate, dimensionally reinforced surface sections which bear integrally formed projections, means are provided for fixing an inner surface of the metal part to the synthetic resin sole, said fixing means includes a thin wire grid embedded in the synthetic resin sole, the thin wire grid being welded to the inner surface of the metal part, and in that the integrally molded projections of the sole fill the projections of the metal part.

4,202,117

SHOE, MORE PARTICULARLY FOR TODDLERS

Pierre Bidegain, Pau, France, assignor to Bidegain S.A., Pau, France

Filed Jan. 23, 1979, Ser. No. 5,854
Claims priority, application France, Nov. 3, 1978, 78 31111
Int. Cl.[2] A43B *3/30*
U.S. Cl. 36—112 6 Claims

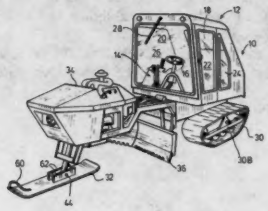


1. A shoe, more particularly for toddlers, comprising an outer sole, a primary sole, a flexible body, a rear reinforcement located at the back of the body and extending from the base of the flexible body to an upper end spaced from the top of the flexible body, and a foam cushion arranged at the back and at the top of the body, wherein said shoe comprises at the back, from the bottom to the top, successive zones of decreasing rigidity and increasing flexibility; namely a first zone comprising, from inside to outside, a soft lining, a foam filling, said rear reinforcement, said flexible body and an upward extension of the outer sole; a second zone comprising, from inside to outside, said soft lining, said foam filling, said inner reinforcement and said flexible body; a third zone comprising, from inside to outside, said soft lining, said foam filling and said flexible body; and a fourth zone comprising said foam cushion surrounded by said soft lining.

4,202,118
SNOWMOBILE TRAIL GROOMER

Ross Held, Port Hope, Canada, assignor to D. T. Equipment Limited, Port Hope, Canada

Filed Nov. 20, 1978, Ser. No. 961,934
Int. Cl.[2] E01H 5/00; A01B 59/048
U.S. Cl. 37—41 8 Claims

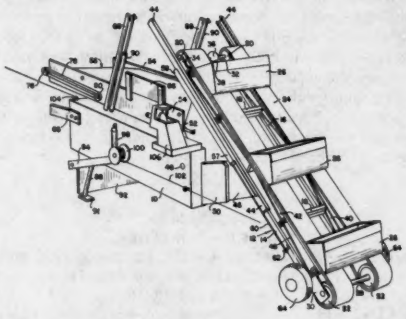


1. A snowmobile trail groomer comprising a main cab for seating the driver, steering and control means for operating the groomer, a steerable ski at the front of the groomer spaced from the main cab for steering and control purposes, an adjustable and tiltable blade disposed between the ski and cab, the drive means comprising an engine and track means comprising bogies and an endless track supported on either side of the cab, the bogies being secured within the track for driving the endless track, the track means being pivotally connected to the cab at a position on the cab for relative pivotal movement with respect to the cab, the engine for driving the bogies for driving the track, and substantial weight mounted on, and supported by, the steerable ski.

4,202,119
WATERWAY CLEANER WITH ENDLESS BUCKET CONVEYOR

Frederick J. Grace, 354 Gifford St., Apt. 4, Falmouth, Mass. 02540

Filed Jan. 9, 1978, Ser. No. 867,775
Int. Cl.[2] E02F 3/14, 9/04
U.S. Cl. 37—69 8 Claims

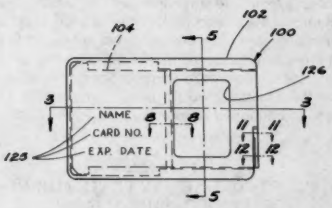


1. A waterway cleaner comprising a floating hull, an extendable and pivotable ladder mounted at one end of said hull, means for controlling the angular position of said ladder from a non-operative substantially horizontal position to a downwardly inclined operative position, means for extending and retracting said ladder in each of said positions, an endless chain of spaced scoops mounted on said ladder, means for driving said endless chain, an endless belt conveyor mounted on the top of said hull, said belt conveyor projecting beyond the otheer end of said hull and being adapted to convey material dumped by said scoops to a scow tied to said other end of said hull, a pair of substantially parallel telescoping legs projecting from the bottom of said hull, each disposed in a substantially vertical plane proximate one side of said hull and each being inclined at a predetermined angle toward said other end of said hull and having an end engageable with the bottom of the waterway, means for telescopically reciprocating each of said legs for controllably engaging said end thereof with the bottom of the waterway for providing additional support for said hull and for forwardly propelling said hull, a scraper blade mounted swingable at said other end of said hull and positionable from an elevated position to a submerged position for engagement with the bottom of said waterway, means for displacing said scraper from said first to said second position, and a pair of freely rotatable support wheels each fastened to one side of said ladder proximate the lower end thereof for rolling engagement with said bottom of said waterway.

4,202,120
IDENTIFICATION CARD, SENSOR, AND SYSTEM

Elton D. Engel, 34005 LaMoyne, Livonia, Mich. 48154

Filed Apr. 10, 1978, Ser. No. 895,011
Int. Cl.[2] G09F 3/00
U.S. Cl. 40—2.2 7 Claims



1. An identification card comprising a frame, a transparent element large enough for impression of an identifying portion of a user's thumbprint or fingerprint thereon, and means for relatively selectively positioning said element and said frame to a first operative position wherein a user is precluded from impressing his thumbprint or fingerprint on said transparent element and to a second operative position where he can impress his thumbprint or fingerprint on said transparent element, wherein said transparent element is disposed on a slide which is slideably mounted on said frame for displacement to said first and second operative positions, and including wiping means effective to wipe a print from said transparent element as said slide is displaced from the second operative position to the first operative position.

4,202,121
DISPLAY DEVICE

George Maris, 2954 Logan Blvd., Chicago, Ill. 60647, and Carl G. Nelson, 1941 N. Cleveland, Chicago, Ill. 60604

Filed Dec. 19, 1977, Ser. No. 862,016
Int. Cl.[2] G09F 1/12
U.S. Cl. 40—152.1 6 Claims

1. A graphic display device for holding and showing visual display such as a number of photographs, and other visual members, the improvement comprising:

a base member;

a display spindle with means attached to the base member and having means extending upwardly therefrom;

a core;

said core having means mountable and rotatable about said spindle;

fin means with means extending outwardly from said core;

said core having means for releasably connecting the fin means;

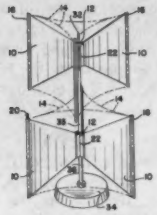
said fin means including outer grip means for engaging and

holding a visual display in a curved, self-supporting manner;

means positioning the core above the base member to allow the core and attached fin means and visual display to rotate freely about said spindle;

said core includes pairs of arm members extending outwardly thereof;

said arm members spaced apart a first distance to provide a receptacle means for receipt of the fin means;



said fin means having a surface and having raised means extending from said surface to provide inner grip means to contain the associated fin within the receptacle means;

said arm members include cantilever means deflectable as said inner grip means of the fin means are inserted within the receptacle means to thereby provide biasing, holding force for retaining the fin means within said receptacle means and attached to said core.

4,202,122

SELF-SUPPORTING UNITARY PLATE FOR HOLDING PHOTOGRAPHIC SLIDES

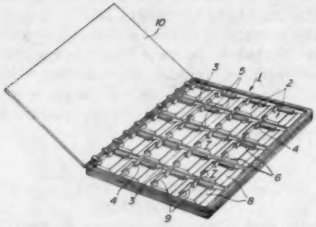
Naokuni Namiki, Hoya, Japan, assignor to Slidex Corporation, Tokyo, Japan

Filed Jul. 24, 1978, Ser. No. 927,411

Claims priority, application Japan, Aug. 30, 1977, 52-115238[U]

Int. Cl.[2] G09F *1/10*

U.S. Cl. 40—158 B **6 Claims**



1. In a self-supporting plate for holding photographic slides including a unitary plate having a plurality of depressions spaced apart in lateral and longitudinal relationship and surrounded by two side partition walls and two end partition walls and having a substantially flat bottom wall, each of said depressions being adapted to receive a photographic slide therein; the improvements comprising:

projections provided on and along part of the opposite side surfaces of said side partition walls, said projections being adjacent to one of said end partition walls in parallel spaced relation to said flat bottom and projecting inwardly of each depression; and

a groove running in said flat bottom of said depression between the mutually opposing projections of each depression, with its opposite side partition walls positioned on the opposite sides of a line on said bottom wall of said depression in parallel thereto, said line being coincident with a line interconnecting the front ends of said mutually opposing projections, as viewed in a direction to insert a photographic slide.

4,202,123

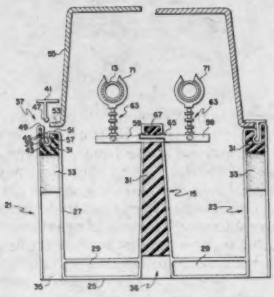
APPARATUS FORMING THREE DIMENSIONAL SIGN DISPLAY CHARACTER

Frank A. Witt, Lexington, S.C., assignor to Colite Industries, Inc., West Columbia, S.C.

Continuation of Ser. No. 700,218, Jun. 28, 1976, abandoned. This application Oct. 30, 1978, Ser. No. 956,101

Int. Cl.[2] G09F *7/14*

U.S. Cl. 40—596 **10 Claims**



1. A sign display element for visually displaying information comprising: a unitary base structure, thinly molded from a plastic-type material and formed to include:

(a) means forming a bottom member having an outside perimeter of the shape of said element;

(b) means forming a continuous hollow wall member upstanding from and disposed along the entire perimeter of said bottom member means, said wall member means having a top side wall, an inside wall and an outside wall, said inside wall narrowly spaced from said outside wall forming the hollow within said wall member; and

rigidifying means providing rigidity and support to said thinly molded plastic material, said rigidifying means formed from a cured resin cast within the hollow of said hollow wall member means and connecting said inside wall to said outside wall at a location intermediate said bottom member means and said topside wall providing rigidity and support to said unitary structure, whereby a rather sturdy, stable, sign display element is formed from a thin plastic molding.

4,202,124

CARTRIDGE LOADER

Robert D. Switzer, 149 Highview Dr., Ft. Thomas, Ky. 41075

Filed May 15, 1978, Ser. No. 905,855

Int. Cl.[2] F42B *39/04*

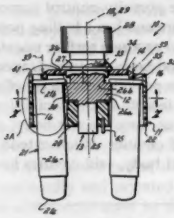
U.S. Cl. 42—89 **24 Claims**

1. An improved cartridge loader comprising

a generally star shaped latch rotatably carried within a casing, said latch cooperating with a plurality of cartridge bores defined by said casing and positioned circumferentially around said latch, said latch being selectively movable between a capture position at which cartridges are latched in temporarily stored relation with said loader and a release position at which cartridges temporarily stored with said loader are released therefrom, and

a semi-automatic rotation device connected with said latch, said device being structured so that the cartridges temporarily stored within said loader are selectively releasable

from that stored relation either by manually rotating said latch, or by exerting an external force axially against said



loader to cause rotation of said latch, from capture position to said release position.

4,202,125

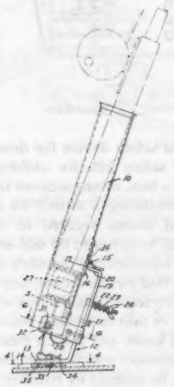
FISHING ROD HOLDER WITH SIGNAL MEANS

Donald J. Kovacs, 366 N. Huron Dr., Au Gres, Mich. 48703

Filed Aug. 16, 1978, Ser. No. 934,209

Int. Cl.[2] A01K *97/12*

U.S. Cl. 43—17 **16 Claims**



1. A fishing rod holder comprising

a bracket,

a rod holding means including a rod holding member,

means for pivotally supporting said rod holding means on said bracket for movement about a generally horizontal axis,

a pair of spaced electrical contacts on said rod holding member,

a contact arm forming a third contact adapted to be normally engaged by said rod holding member at a point intermediate said spaced first and second contacts,

means yieldingly mounting said contact arm on said bracket,

a signal device,

and means providing a circuit between either of said pair of contacts and said signal device such that when the rod holding member is moved in one direction or another relative to the bracket a predetermined distance, a circuit is completed through said contact arm to energize said signal means.

4,202,126

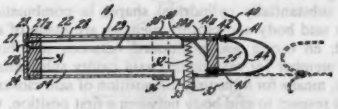
FISH STRIKE DETECTING APPARATUS

Edward Pietrenka, 315 S. Park, Westmont, Ill. 60559

Filed Sep. 20, 1978, Ser. No. 943,997

Int. Cl.[2] A01K *97/12*

U.S. Cl. 43—17 **15 Claims**



1. A strike detecting apparatus for use with a fishing rod and line assembly comprising means for engaging a portion of said fishing rod and line assembly that experiences movement upon a fish striking the line thereof, means for supporting a pair of relatively movable contact pieces, biasing means for urging said contact pieces toward each other to close said contacts, insulator means coupled to said engaging means for removable placement between said contact pieces, electrical indicator means, an electrical energizing circuit including a source of electrical energy coupled between said indicator means and said contact pieces, and said insulator means being removable from between said contact pieces in response to movement of said line and pole engaging means upon a strike of said fishing line to permit closure of said contact pieces and energizature of said electrical indicator means.

4,202,127

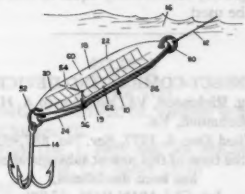
NOISE MAKING LURE

Larry L. Marek, 444 Benson, N.E., Grand Rapids, Mich. 49503

Filed May 16, 1977, Ser. No. 797,049

Int. Cl.[2] A01K *86/01*

U.S. Cl. 43—42.31 **8 Claims**



1. A noise making fishing lure comprising first and second sonorous plates mounted on top of each other and connected together loosely at front and rear ends of the plates, the plates being shaped with different surface contours on the surfaces opposing each other such that the flow of water over the lure as it is pulled through the water causes a relative vibration between the plates, the vibration causing the plates to rattle together so as to produce a distinct noise, the plates being formed and positioned such that a protrusion on one plate fits into a recessed portion in the other plate when the plates are connected together.

4,202,128

ADJUSTABLE FLOAT SINKER

Robin E. T. Hill; Alan W. Mann; Ean L. McDonald, and John L. Perdrix, all of 27 Gairlock St., Applecross, Western Australia, Australia

Filed Feb. 28, 1978, Ser. No. 882,160

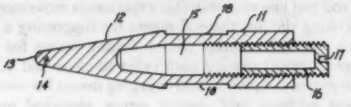
Claims priority, application Australia, Mar. 4, 1977, PC9288

Int. Cl.[2] A01K *93/00*

U.S. Cl. 43—43.14 **2 Claims**

1. An adjustable fishing float-sinker assembly comprising a substantially cylindrical body having a solid first end tapered

to a rounded apex, said first end including means for connecting said body to a fishing line, said means for connecting comprising only a single opening in said first end, and a second end defining an opening, wherein said body defines a cavity open at its second end; a closure member free of any connection with a fishing line; means for threadingly connecting said closure member to said body for enclosing said cavity in a substantially water-tight manner wherein said body and closure member have a substantially cylindrical shape, in combination, and wherein said body and closure member are made of a plastic material; an o-ring seal positioned between said body and closure member for maintaining said cavity substantially water-tight; means for adjusting the position of said closure member with respect to said body between a first position, wherein said body and closure member displace a first volume, a second position, wherein said body and closure member displace a



second volume, said second volume being less than said first volume, and intermediate positions between said first and second positions, wherein said body and closure member displace intermediate volumes; said body and closure member having a size, and made of a material having a density, such that the body and closure member have a specific gravity substantially equal to the specific gravity of water, and such that when said body and closure member is in said first position, the float-sinker assembly has a specific gravity less than that of the water in which it is to be used, when said body and closure member is in said second position, the float-sinker assembly has a specific gravity greater than that of the water in which it is to be used, and when said body and closure member is in a selected intermediate position, the float-sinker assembly has a specific gravity substantially equal to that of the water in which it is to be used.

4,202,129

INSECT-COMBATTING DEVICE

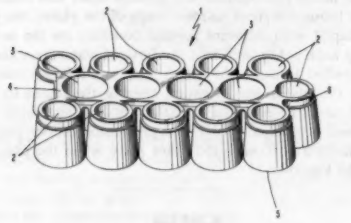
Jack Greenberg, Richmond, Va., assignor to A. H. Robins Company, Inc., Richmond, Va.

Filed Dec. 6, 1977, Ser. No. 857,992

The portion of the term of this patent subsequent to Dec. 7, 1993, has been disclaimed.

Int. Cl.[2] A01N *9/36, 17/00*

U.S. Cl. 43—131 **10 Claims**



1. A device for combatting insects comprising a shaped solid body having a porous surface capable of gradually and continually releasing naled insecticide in an amount sufficient to provide an insecticidally active concentration of said naled over a prolonged period of time, said device comprising a synthetic resinous matrix material, from about 15 to about 35 weight percent of naled and a minor amount effective to retard spewing of the insecticide of finely divided silica particles and at least one C_{14} to C_{20} saturated aliphatic carboxylic acid or a salt or ester thereof, said device being formed from a mixture of said synthetic resin, naled, finely divided silica particles, C_{14} to C_{20} aliphatic saturated carboxylic acid or salt or ester thereof and a surface porosity control component that is nonreactive in the mixture and has a boiling point at or below the curing temperature to produce surface opening in communication with pores in said body by vaporization of said porosity control component to provide for release of naled gas at a rate effective to control insects in the vicinity of said body, but insufficient to form as spew on the body, said shaped body having a plurality of cavities which extend entirely through one dimension of said body, said cavities having substantially parallel axes.

4,202,130

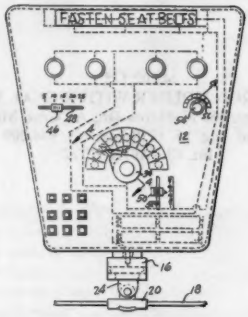
AMUSEMENT DEVICE

Terry G. Smith, 1002 Figuroa St., Folsom, Calif. 95630

Filed May 31, 1978, Ser. No. 911,080

Int. Cl.[2] A63G *31/02*

U.S. Cl. 46—1 R **1 Claim**



1. An amusement and safety device for detachable connection to an automobile safety belt for children riding in an automobile comprising a box, means secured to the safety belt for said child, means including a switch on said box to demountably engage said means secured to the safety belt, whereby said switch will be actuated by said engagement, said box containing electric batteries and circuitry including lights, said circuitry including said switch means, and an electric sign on said box illuminated by some of said lights when said switch is engaged, the surface of said box being provided with push buttons and a rotatable knob, and switch means operated by said rotatable knob to connect selected lights to said circuitry whereby the child may be amused by rotating said knob.

4,202,131

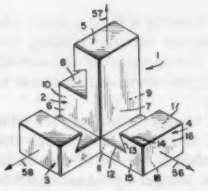
INTERCONNECTING BUILDING BLOCKS

Victor J. Poleri, 207 E. 15th St., New York, N.Y. 10003

Filed Feb. 10, 1978, Ser. No. 876,623

Int. Cl.[2] A63H *33/08*

U.S. Cl. 46—25 **5 Claims**



1. A block unit designed to interconnect with other blocks to

form three-dimensional structures comprising a central hub and at least three identical attachment arms projecting from said central hub, said attachment arms extending outwardly along non-parallel axes projecting from said central hub, at least one of said axes projecting out of a plane defined by two other of said axes, each of said attachment arms comprising a first wall member projecting perpendicularly outward from said face to which it is attached, a second wall member attached to the outboard end of said first wall member, said second wall member being inclined inwardly toward said face to which said first wall member is attached, and a third wall member attached to the inboard end of said second wall member and directed outwardly and oriented parallel to said first wall member, said attachment arms so dimensioned to allow interconnection with an identical attachment means on another block thus allowing a three-dimensional multi-blocked structure to be assembled.

4,202,132

HOLLOW STRUCTURAL ELEMENT

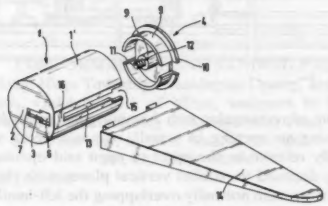
Artur Fischer, Weinhalde 34, D-7244 Waldachatl 3 (Tumlingen, Fed. Rep. of Germany

Filed Jun. 6, 1978, Ser. No. 913,081

Claims priority, application Fed. Rep. of Germany, Jun. 29, 1977, 2729264; Jan. 19, 1978, 2802149

Int. Cl.[2] A63H *33/00, 27/00, 33/10, 33/08*

U.S. Cl. 46—16 **18 Claims**



1. A hollow structural element, comprising a cylindrical hollow member having an axis, a circumferential wall and two ends spaced from one another in an axial direction, said hollow member having an end wall arranged to close one of said ends of said circumferential wall; a cover member arranged to close the other end of said circumferential wall of said hollow member; and means for connecting the hollow structural element with other structural elements, said means including an undercut projection provided in said cover member and arranged for inserting into an undercut groove of another structural element, and an undercut lateral slot provided in said end wall of said hollow member and arranged for interacting with an undercut projection of a further structural element so that the structural elements can be connected with each other while being located axially adjacent to one another, said undercut lateral slot having a first portion of an enlarged cross section which is located adjacent to said circumferential wall and dimensioned so that the projection of the further structural element passes through said enlarged portion, and a second portion of a reduced cross section which extends from said first portion toward said axis and is dimensioned so that the projection of the further structural element engages in said second portion, said second portion of said undercut lateral slot of said end wall extending outwardly beyond said axis by a distance which is substantially equal to half of a transverse dimension of said undercut projection, so that when such hollow structural elements are connected with one another by means of interaction of the undercut lateral slot of one of the structural elements with the undercut projection of the further structural element, the circumferential walls of the hollow members of the structural elements are in alignment with each other.

4,202,133

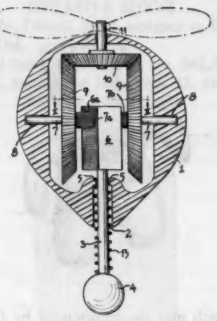
SPINNING TOP

Raphael Sahar, 2 King David St., Tiberias, Israel

Filed May 31, 1978, Ser. No. 911,177

Int. Cl.[2] A63H *1/06*

U.S. Cl. 46—67 **3 Claims**



1. A spinning top comprising a hollow body having an inwardly extending bore in which slides a shaft the innermost end of which carries a Z-profiled member, the sidewardly extending portions of the said Z-profiled member being in frictional contact with oppositely disposed, co-directional axles seated rotationally in the wall of the said hollow body, a crown wheel being fixedly keyed on each of the said axles, both said crown wheels meshing with a pinion which is fixedly connected to the said hollow body.

4,202,134

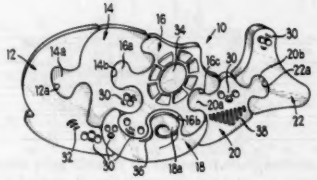
WATER TOY

Howard J. Morrison, Deerfield, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.

Filed Dec. 1, 1977, Ser. No. 856,349

Int. Cl.[2] A63H *23/10*

U.S. Cl. 46—92 **19 Claims**



1. A water toy comprising:

a plurality of puzzle pieces formed of generally lightweight material;

each of said puzzle pieces includes an outer contoured surface shaped to removably interlock with the contoured surface portion of an adjacent puzzle piece;

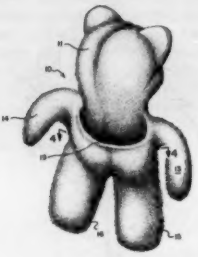
means for defining the contoured surface of the puzzle pieces in the form and shape of a creature, said puzzle pieces being shaped to cumulatively form a predetermined outer profile such as that of a creature or the like when assembled with their contoured surfaces in proper interlocked relation.

4,202,135

DOLL

Ethel J. Siler, 4595 W. 4955 S., Kearns, Utah 84118

Filed Mar. 6, 1978, Ser. No. 883,357
Int. Cl.[2] A63H *3/14*
U.S. Cl. 46—154 **1 Claim**



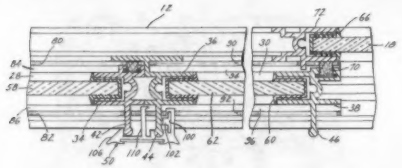
1. A doll which may be manipulated by the insertion of a users fingers therein, comprising
a head;
a upper torso body portion fixed to and movable with said head;
a pair of upper limb members hingedly connected to the upper torso body portion;
a pair of lower limb members, hingedly connected to a lower edge of the upper torso body portion;
a single piece of sheet fabric forming an upwardly opening leg pocket at the back of each lower limb member, a pouch extending over the open upper end of each leg pocket and upwardly adjacent a portion of the upper torso member above the lower limb members and a portion of the upper limb members, whereby manipulation of said lower limb members by the insertion of a users finger in said leg pockets thereof will simultaneously cause movement of said upper limbs thereof.

4,202,136

DUAL SLIDING SASH SECURITY WINDOW

Harry M. Riegelman, Diamond Bar, Calif., assignor to Rusco Industries, Inc., Fullerton, Calif.

Filed Mar. 9, 1979, Ser. No. 19,099
Int. Cl.[2] E05D *13/04*
U.S. Cl. 49—449 **6 Claims**



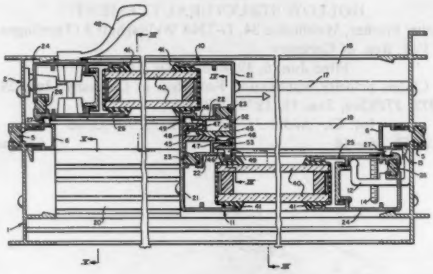
1. In combination:
a window structure including a pair of sashes adapted for horizontal sliding movement,
said sashes having respective stiles in abutment in the closes positions thereof,
said stiles having vertical ribs extending from the faces thereof on one side of said structure;
a plate carried by one of said stiles on its opposite face, said plate being parallel to said opposite face and overlaying equal areas of said stiles;
and a latch mechanism carried by one of said stiles on the rib thereof,
said latch mechanism including a latch element spanning both ribs, said ribs having enlarged outer portions,
said latch element having one edge portion thereof slidable on said one stile,
said latch element being symmetrically contoured with respect to the plane of abutment of said stiles;
said latch element having a shoulder to engage the rib of said other stile;
and means biasing said latch element toward the position of engagement by said shoulder of said other rib.

4,202,137

SLIDING DOOR OR WINDOW

Robert P. Randall, Pittsburgh, Pa., assignor to Three Rivers Aluminum Company, Pittsburgh, Pa.

Filed Nov. 8, 1978, Ser. No. 958,709
Int. Cl.[2] E05D *15/08*
U.S. Cl. 49—458 **5 Claims**



1. A pair of rectangular sash framing glass panes for normally closing an opening in a wall, one sash being slidable horizontally relative to the other to open said opening, said sash being disposed in parallel vertical planes with the right-hand end of one sash normally overlapping the left-hand end of the other sash, said overlapping ends including vertical sash rails, each rail being provided with horizontally spaced inner and outer vertical flanges extending toward the opposite end of the same sash, all of said flanges being disposed between said rails, the inner flanges of the two rails being spaced apart and disposed between said outer flanges in overlapping engagement therewith to interlock the two rails, and a pair of vertical weather-sealing strips disposed in the space between said inner flanges, each strip being connected to a sash rail with the strips extending toward each other and overlapping along a vertical plane diagonal to the sash, each strip being disposed between the inner flange connected to the same rail as that strip and the other strip, and the strips engaging each other in said plane to form a weather seal between said rails.

4,202,138

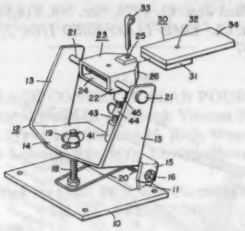
BEZEL GRINDING ATTACHMENT FOR A DOP STICK HOLDER

Edward E. Smith, New London, Iowa, assignor to Geode Industries, Inc., New London, Iowa

Filed Jun. 14, 1979, Ser. No. 48,476
Int. Cl.[2] B24B *11/00*
U.S. Cl. 51—229 **3 Claims**

1. A cabochon bezel grinding attachment for use with a dop stick holder which includes a laterally extensive dop stick receiver and a carrying structure for the receiver having an underportion spaced below the receiver, the receiver having a rear portion hinged to the carrying structure about a horizontal axis, a forward portion, and a laterally extensive opening extending through the receiver in a direction from said forward to said rear portion thereof, said opening having a cross-sectional configuration defined by interior walls extending in said direction, and a transverse vertical bore through said forward

receiver portion and intersecting said opening thereof, the attachment comprising: a laterally extensive bezel table having rear and forward portions, the table rear portion having a cross-sectional configuration complementary with that of the receiver opening and being slidably and fittably receivable therein, the table rear portion being further provided with a transverse vertical bore therethrough alignable with said receiver bore; fastening means for insertion through the receiver and table bores for removably securing the table in the receiver opening; and adjustable means for disposal between said forward portion of one of the receiver and the table on the one hand and said underportion of the carrying structure on the other hand effective both to support the bezel table forward portion upon said underportion and to adjust the inclination of the bezel table relative thereto about said axis.



4,202,139

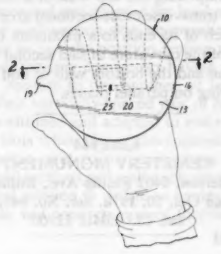
CONFORMABLE HAND SANDING PAD

In S. Hong, Hugo Township, Washington County, and Glenn E. Roelofs, Oakdale, both of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Apr. 6, 1978, Ser. No. 893,989

Int. Cl.[2] B24D *15/04*

U.S. Cl. 51—393 **5 Claims**



1. A hand-held sanding pad comprising

(1) a conformable, self-supporting pad at least about 1/32 inch thick having one major surface and an opposite major surface, said one major surface being capable of providing adhesive attachment for a sheet or pressure-sensitive adhesive-coated abrasive material during use yet permitting clean removal of said sheet after use, said pad being formed of a material which has a flexural rigidity of at least 500 mg. cm. and a Shore A durometer hardness value of less than 40;

(2) attached to said opposite major surface of said pad, handle means to maintain the pad in contact with the hand of the user during use, said handle means being provided by at least three segments of hook- and loop-type fastening material, with one segment of said fastening material being permanently attached to said opposite major surface and the other segments being temporarily engaged adjacent their ends to form a ring structure capable of accommodating at least one finger of the user and having on its outer surface a segment of material which is temporarily engaged with said attached segment to provide an attachable-detachable structure.

4,202,140

ABRASIVE SHEET

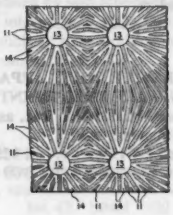
Lorenzo E. Alessio, Cairoli, Italy, assignor to Black & Decker Inc., Newark, Del.

Filed Sep. 25, 1978, Ser. No. 945,374

Claims priority, application Italy, Sep. 23, 1977, 22348 A77

Int. Cl.[2] B24D *11/00*

U.S. Cl. 51—395 **2 Claims**



1. An abrasive sheet for cutting a workpiece adapted for use with a sanding tool having suction means, the abrasive sheet comprising:

a base sheet having a plurality of apertures formed therein; and,

abrasive means secured to said base sheet for defining a plurality of channels thereon extending outwardly from each one of said apertures; and,

said abrasive means defining a plurality of channels communicating with each two mutually adjacent ones of said apertures.

4,202,141

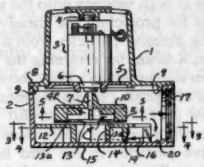
TWO WAY SPARK PLUG CLEANER AND METHOD

Roy A. Fricke, River Forest, Ill.

Filed Nov. 8, 1978, Ser. No. 958,711

Int. Cl.[2] B24B *1/00, 3/34*

U.S. Cl. 51—412 **11 Claims**



1. A spark plug cleaner including in combination,

a closed hollow housing comprising a lower impeller housing and an upper motor housing, each of said housings having interfitting margins whereby said housings may be held frictionally and closely fitting relation to provide a closed but separable hollow housing,

a drive means mounted in said upper motor housing and having a vertical drive shaft extending downwardly into said lower impeller housing,

a multi-directional impeller mounted in said lower impeller housing and operatively connected to said vertical drive shaft, said impeller having an axial inlet opening downwardly therefrom and a plurality of vanes about the periphery thereof,

elastic spark plug holder means mounted in the side wall of

said lower impeller housing, said spark plug holder means adapted to receive and hold a spark plug in a horizontal position and in register with respect to the outer periphery of said impeller, and

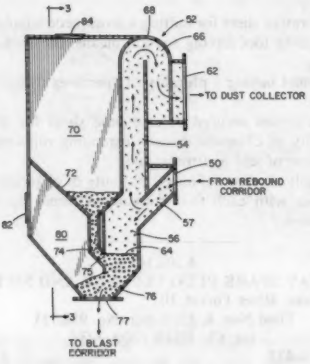
flow directing baffle means positioned between said impeller and the base of said lower impeller housing, such that upon the rotation of said multi-directional impeller by said drive means particulate is discharged radially outwardly against said mounted spark plug and said baffle means provides a path for predeterminely guiding the flow of air and spent particulate discharged by said impeller towards said axial inlet opening of said multi-directional impeller and into the eye of said rotating impeller for subsequent discharging of the flow of air and particulate by said impeller against the spark plug until the cleaning operation is completed.

4,202,142

ABRASIVE PARTICLE BLAST APPARATUS FOR SURFACE TREATMENT

Harvey G. Van Fossen, Mishawaka, Ind., assignor to Wheelabrator-Frye Inc., Hampton, N.H.

Filed Jul. 17, 1978, Ser. No. 925,116
Int. Cl.[2] B24C *3/06, 7/00*
U.S. Cl. 51—425 **8 Claims**



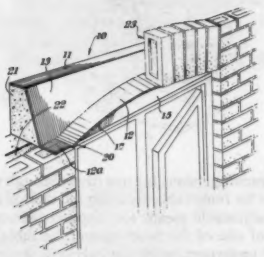
1. An apparatus for treatment of surfaces by projecting dry abrasive particles at high velocity onto the surface including a projecting means for projecting the abrasive particles, a feed means for feeding abrasive particles from a feed hoper to the projecting means, a means for returning the abrasive particles, dust and dirt from the surface to a level above the feed hopper, the improvement comprising separating means for treating the returned abrasive particles, dust and dirt for separation of abrasive particles from dust and dirt, means for recycle of the separated abrasive particles to the feed hopper and means automatically controlling the addition of abrasive particles to the recycled abrasive particles to provide for continuous projection of abrasive particles from the projecting means, said controlling means comprising a storage bin for holding a supply of abrasive particles, an inlet opening in the storage bin for replenishing the abrasive particles and an outlet opening at the bottom portion of the storage bin, a passage communicating the storage bin with the hopper comprising an upper substantially vertically disposed portion and a contiguous lower portion extending angularly downwardly from the vertically disposed portion with the vertically disposed portion having an inlet at its upper end in communication with the outlet of the storge bin and the angularly disposed portion having an outlet at its lower end at a level corresponding to the level of abrasive particles desired for insuring supply of abrasive particles for continuous projection from the projecting means whereby flow of abrasive particles from the outlet of the angularly disposed portion is blocked when recycled abrasive particles are at a level above the outlet and abrasive particles flow from the passage when the level of abrasive particles falls below the outlet.

4,202,143

COMBINED FORMWORK AND CAVITY TRAY

Brian Mear, and Gary Smith, both of 26A Bull Ring, Ludlow, Shropshire, England

Filed Jun. 12, 1978, Ser. No. 914,514
Int. Cl.[2] E04D *13/00*; E06B *1/04, 1/24*
U.S. Cl. 52—97 **12 Claims**



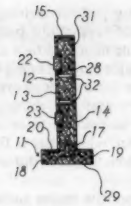
1. An element which constitutes a combined formwork and cavity tray for use in bridging an opening in a wall, said element comprising: a first web portion having an inner edge, a second web portion having an inner edge, a third web portion having two edges of which one is connected to the inner edge of the first web portion and of which the other is connected to the inner edge of the second web portion, said third web portion making, in any transverse section through the element, an included angle of more than 90° with each of said first and second web portions, said second web portion being curved in the vertical direction toward the plane containing an uppermost elongate flat surface of said first web portion, said second web portion comprising the top wall of a second box-section member whose transverse cross-sectional area increases from a minimum at each of its ends to a maximum intermediate said ends by virtue of the curvature of said second web portion, the first web portion and the bottom wall of said second box-section member lying on parallel planes.

4,202,144

CEMETERY MONUMENT

Norman B. Patterson, 4402 Phillip Ave., Billings, Mont. 59101

Filed Oct. 10, 1978, Ser. No. 949,959
Int. Cl.[2] E04H *13/00*
U.S. Cl. 52—103 **10 Claims**



1. A cemetery monument including a base and a main body section extending upwardly from said base; said body section including an outer shell formed of a plurality of textured corrosion-resistant metal panels, the edges of which are affixed to each other forming a substantially enclosed chamber, said

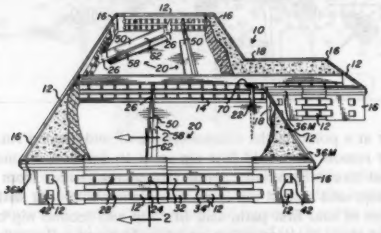
body section having at least one opening in the face portion thereof, said face portion having peripheral flanges around the opening therein extending into the interior of said body section generally perpendicular to said face portion, a text display member disposed within said opening with surfaces thereof adjacent to said peripheral flanges, means securing said text display member to said peripheral flanges including a plurality of pins disposed through openings in said peripheral flanges and extending into said text display member in a direction generally parallel to said face panel, and said chamber of said body section being substantially filled with concrete.

4,202,145

CAST-IN-PLACE CONCRETE SLAB POURING FORM

Alton R. Coulter; Lonnie G. Hubbard; Vincent P. Johnston, all of Sheridan, Wyo., and Michael H. Rich, Westminster, Colo., assignors to Leav-Er-Rite Mfg. Co. Incorporated, Sheridan, Wyo.

Filed Nov. 20, 1978, Ser. No. 961,998
Int. Cl.[2] E02D *27/00*
U.S. Cl. 52—169.1 **10 Claims**



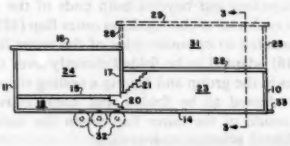
1. The concrete pouring form for slabs and the like which comprises: a plurality of elongate sheet metal wall sections each having a body containing two horizontal rows of vertical slots spaced one above another in vertically-aligned pairs; wall anchoring means having a vertically-spaced pair of down-turned hooks positioned and adapted for hooked insertion into a selected pair of wall section slots cooperating therewith to support the latter in upright position resting upon one of its edges; and, corner-forming connectors having wings disposed in right angular relation to one another, at least one of said wings having a first vertically-spaced pair of horizontally-disposed tongues positioned and adapted to enter a selected pair of wall sections slots when placed thereagainst in face-to-face overlapping relation, said corner connectors, and at least a portion of said wall sections and wall-anchoring means cooperating in assembled relation to define an enclosure effective to receive and retain wet concrete poured therein.

4,202,146

TRANSPORTABLE MODULE FOR TRILEVEL DWELLING

William C. Adams, 2822 SE. 8th St., Ocala, Fla. 32670

Filed Mar. 1, 1979, Ser. No. 16,720
Int. Cl.[2] E04H *3/00*
U.S. Cl. 52—236.4 **7 Claims**



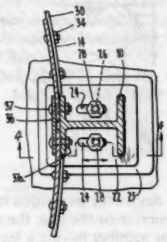
1. A transportable housing module adapted for use in the construction of a dwelling comprising a first and a second dwelling compartment positioned above a rectangular foundation floor extending the entire length and width of said module, exterior vertical side walls and end walls circumscribing the perimeter of said foundation floor, an interior wall parallel to said end walls and substantially centrally disposed with respect to the length of said foundation floor, a short staircase extending from said foundation floor in said first compartment to a second floor of said second compartment, a long staircase positioned adjacent said short staircase angled in the opposite direction therefrom and extending from said second floor to a third floor positioned at a higher elevation than said second floor and laterally displaced therefrom, and a first roof positioned atop the exterior walls bounding said second compartment at an elevation above said third floor, whereby a storage compartment is defined by said foundation floor, second floor, exterior walls and interior wall, and said third floor is adapted to support an assembly of structural components which define a third dwelling compartment.

4,202,147

SILO

Georg Krogh, 10 Sycamore St., Leeton, N.S.W., Australia

Filed Aug. 30, 1978, Ser. No. 938,231
Claims priority, application Australia, Sep. 5, 1977, PD1505
Int. Cl.[2] E04H *7/00*
U.S. Cl. 52—245 **6 Claims**



1. A circular storage silo comprising a plurality of spaced-apart vertical columns arranged in a circular fashion, wall members connected to said columns to form an enclosure, a support plate member for each column mounted on the surface of the ground, a slotted base plate for each column being slidably mounted on its associated support plate, means on the support plate engageable with the slots of the base plate to provide limited radial movement of said base plates on said support plates, each of said columns being mounted on and fixedly connected to a base plate wherein said columns can move radially outwardly when said wall members are subjected to perimetric tension.

4,202,148

METHOD OF MAKING THICK-WALLED REFRACTORY FIBER MODULES AND THE PRODUCT FORMED THEREBY

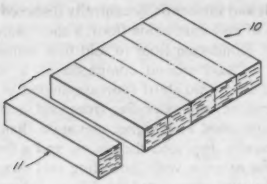
Carl E. Frahme, and Gary E. Wygant, both of Valencia, Calif., assignors to Industrial Insulations, Inc., City of Industry, Calif.

Filed Jun. 26, 1978, Ser. No. 919,230
Int. Cl.[2] E04B *1/38*; F27D *1/16*
U.S. Cl. 52—592 **16 Claims**

1. A lightweight dimensionally-stable, homogeneous, generally non-flexible refractory liner element for lining the wall of a high temperature chamber consisting of:

a multiplicity of layers of spun refractory fibers typically having a length of 3 to 6 inches accreted by vacuum deposition to a thickness of 3 to 8 inches from an aqueous slurry of said fibers and held bonded together by binder

material; and at least one corner of said element being deeply rabbeted ship-lap fashion from end-to-end and adapted to mate complementally with the similarly rab-



beted corner of another of said elements to form a lining for a high temperature chamber with the planes of said fiber layers lying in planes generally normal to the chamber wall.

4,202,149

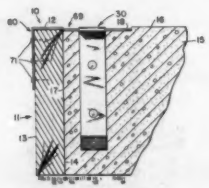
CONSTRUCTION DEVICE

Norman A. Betrue, Sr., 3937 Feemster, Visalia, Calif. 93277

Filed May 12, 1978, Ser. No. 905,167

Int. Cl.[2] E04B 1/38

U.S. Cl. 52—699 **10 Claims**



1. A construction device for use with a support in anchoring a work object on concrete or the like, the construction device comprising an anchor member having a leg portion for embedding in concrete; means borne by the anchor member for interconnecting the anchor member and a second object; and a fastening member having first and second projections so related as to be interchangably connectable to the interconnecting means for positioning in a first attitude, with the first projection secured on said support and the second projection connected to said interconnecting means supporting the anchor member for the pouring of concrete about the leg portion thereof, and a second attitude, with the first projection connected to the interconnecting means supported by the anchor member on said concrete and the second projection extending therefrom for securing to said work object.

4,202,150

DEVICE FOR PRODUCING ENVELOPES IN A CONTINUOUS OPERATION

Nils E. Petersson, Nybro, Sweden, assignor to AB Sture Ljungdahl, Nybro, Sweden

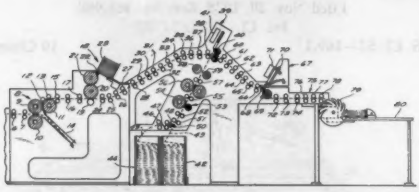
Continuation of Ser. No. 742,840, Nov. 18, 1976, which is a continuation-in-part of Ser. No. 722,489, Sep. 13, 1976, abandoned, which is a continuation of Ser. No. 471,484, May 20, 1974, abandoned. This application Jun. 12, 1978, Ser. No. 914,950

Claims priority, application Sweden, May 25, 1973, 7307391

Int. Cl.[2] B65B 11/48

U.S. Cl. 53—206 **5 Claims**

1. An apparatus for producing a folder in the form of an envelope with at least one enclosure, said envelope being made from an envelope blank having a first section, a second section, and a third section formed by a first crease and a second crease, respectively, comprising: first conveying means for conveying enclosures along a first rectilinear path; second conveying means for conveying envelope blanks along a second rectilinear path; said first and second paths intersecting at a common location; and an enveloping station located at said intersection of said first and second paths for folding said envelope blanks about said enclosures and about said first crease dividing said first and second sections, said first section having a first and a second strip of adhesive thereon, said enveloping station comprising a first rotating roller mounted below said first path, and a second rotating roller, said first and second rotating rollers being rotatably mounted in said enveloping station so as to receive therebetween said envelope blanks from said second conveying means, said first and second rotating rollers defining therebetween a first nip below the end portion of said first path for advancing said envelope blanks upwardly toward said end portion, said second roller having vacuum means for holding said first crease of each envelope blank fast thereto, and a third rotating roller rotatably mounted above said second rotating



roller at a point on the circumference of said second rotating roller remote from said first nip so as to define a second nip spaced circumferentially about said second roller from said first nip, said second nip lying in a plane containing said end portion of said first path, said first nip and second nip being spaced about the circumference of said second roller by more than 90 degrees but less than 180 degress in the direction of rotation of said second roller, said enveloping station further comprising a heating device for heating said first section when said first crease is held fast by said vacuum means, so that said first and second adhesive strips formed on said first section become activated and thereby glue the first and second sections together upon advancement of said envelope blank through said second nip, said heating device being mounted above said third roller, whereby prior to the folding and sealing of said first and second sections at least one enclosure is advanced to said second nip and thereby enclosed in said envelope blank between said first and second sections.

4,202,151

APPARATUS FOR PRODUCING CIGARETTE PACKS

Heinz Focke, and Kurt Liedtke, both of Verden, Fed. Rep. of Germany, assignors to Focke & Pfuhl, Verden, Fed. Rep. of Germany

Division of Ser. No. 730,116, Oct. 6, 1976, Pat. No. 4,102,486. This application Apr. 20, 1978, Ser. No. 898,042

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1975, 2445256

Int. Cl.[2] B65B 7/04

U.S. Cl. 53—378 **12 Claims**

1. An apparatus for folding the flaps of a sealable blank wrapped around a group of cigarettes in a tubular manner with the flaps projecting out beyond both ends of the group and including, at each end of the blank, an outer flap (**15**), side flaps (**17, 18**) connected to opposite sides of the outer flap, and an inner flap (**16**) adapted to be folded directly over the ends of the cigarettes in the group and having a sealing strip (**19**) on its outer edge adapted to be folded and compressively urged against the inside of the outer flap when the latter is in an upright, unfolded position, comprising:

(a) a rotatable turret (**33**),

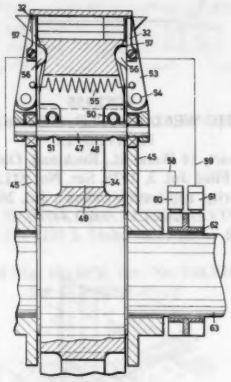
(b) a plurality of spaced rectangular pockets (**30**) radially disposed around the outer periphery of the turret,

(c) each pocket being open at both ends and having its axis parallel to the turret axis,

(d) a U-shaped abutment member **(31)** defining the outer and lateral side walls of each pocket and extending out beyond both opposite ends of a group of cigarettes wrapped in a tubular blank and disposed in said pocket,

(e) the outer flaps **(15)** and the side flaps **(17, 18)** bearing against the walls defined by the abutment member,

(f) a pair of radially disposed sealing shoes **(29)** slidably mounted on opposite sides of the turret adjacent the open



ends of each pocket and transversely movable relative to the pocket axis to individually fold an upright inner flap against the ends of the groups of cigarettes and to simultaneously fold the sealing strip attached to the outer edge of said inner flap and compressively urge said strip against the inside of an upright outer flap bearing against said abutment member, and

(g) means for radially moving said sealing shoes both towards and away from the pockets at predetermined times during the rotation of said turret.

4,202,152

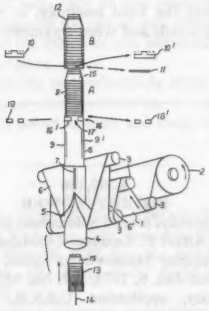
WRAPPING PROCESS

Robert E. Coles, Leamington Spa, England, assignor to General Foods Limited, Banbury, England

Continuation-in-part of Ser. No. 795,355, May 9, 1977, abandoned. This application Jul. 10, 1978, Ser. No. 923,112

Int. Cl.[2] B65B *9/12*

U.S. Cl. 53—451 **5 Claims**



1. A continuous form-fill seal process for forming a package of a stack of nesting cups, some cups of which contain beverage making material, which process comprises forming a tube from an upwardly moving sheet of wrapping material, transversely heat-sealing a leading portion of said tube, loading vertically upwards a stack of nesting cups, some cups containing beverage making material, into the open end of said tube by means of a ram or like lifting device, flattening said tube below the lifted cups, partially transversely, heat-sealing the flattened tube below the cups to secure the stack of cups within the tube and to provide the tube with a remaining transverse open portion, removing the ram or like lifting device from the tube through the remaining open portion thereof, and thereafter transversely heat-sealing said open portion of said tube to form a hermetically sealed package.

4,202,153

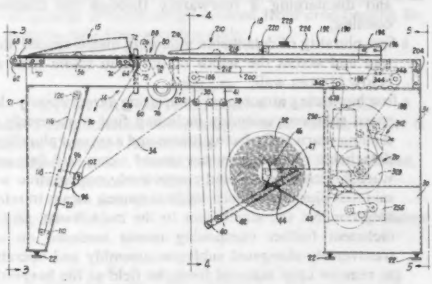
METHOD AND APPARATUS FOR LOADING CONTAINERS HORIZONTALLY

Bernard Lerner, Hudson, and Dana J. Liebhart, Streetsboro, both of Ohio, assignors to Automated Packaging Systems, Inc., Twinsburg, Ohio

Filed Oct. 25, 1977, Ser. No. 845,114

Int. Cl.[2] B65B *43/36*

U.S. Cl. 53—459 **32 Claims**



1. A method of loading a container, comprising:

(a) providing a tubular web having a container portion connected to the web along a line of weakness, the container portion having a sealed end part and an opposite end part provided with a transverse opening;

(b) advancing the web in one direction along a path of travel to position the container portion at a loading station;

(c) opening the container portion while the container portion is connected to the web;

(d) placing a product to be loaded into the container portion onto a product carrier positioned at a first position;

(e) displacing the product carrier in a direction generally the same as said one direction into a second, extended position where the carrier extends into the opened container portion;

(f) pushing the product to be packaged from the carrier into the container portion; and,

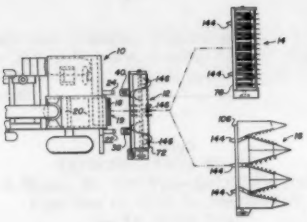
(g) restraining the web and separating the container portion from the restrained web with forces applied to the container portion by a selected one of the carrier and the product after the performance of step d and prior to the completion of step f.

4,202,154

CROP HEADER FOR A CROP HARVESTING MACHINE HAVING A CROP CONSOLIDATING COMPONENT WHICH DETACHABLY MOUNTS A PLURALITY OF INTERCHANGEABLE CROP GATHERING COMPONENTS

T. William Waldrop, New Holland, and Joe E. Shriver, East Earl, both of Pa., assignors to Sperry Rand Corporation, New Holland, Pa.

Filed Aug. 11, 1976, Ser. No. 713,565
Int. Cl.[2] A01D *47/00*
U.S. Cl. 56—2 **7 Claims**



2. A harvesting header for a mobile harvesting machine comprising:

a transversely elongated main frame attachable to the harvesting machine, said frame comprising opposite sides, a bottom wall extending between said opposite sides, and a rear wall having a crop discharge opening;

a transverse crop conveying means mounted on said main frame and extending between said opposite sides above the bottom wall for moving crop material along said floor and discharging it rearwardly through the discharge opening;

a first plurality of detachable mounting means spaced along said and across the width of the main frame generally below bottom wall;

a first harvesting attachment comprising a transversely elongated subframe assembly including first transversely extending rearwardly facing means and a second plurality of detachable mounting means spaced along said first rearwardly facing means and respectively cooperative with said first plurality of detachable mounting means to releasably connect the attachment to the main frame, said attachment further comprising means mounted on said transversely elongated subframe assembly and operative to remove crop material from the field as the harvesting machine advances and deliver the crop material to said crop conveying means when the attachment is mounted on the main frame, said first rearwardly facing means operatively disposed adjacent said main frame under conditions where said first harvesting attachment is connected to the main frame;

and a second harvesting attachment comprising a second transversely elongated subframe assembly including second transversely extending rearwardly facing means and a third plurality of detachable mounting means spaced along said second transversely extending rearwardly facing means and respectively cooperative with said first plurality of detachable mounting means to releasably connect the second harvesting attachment to the main frame, said second harvesting attachment further comprising a plurality of row units mounted on said second transversely elongated subframe assembly, each row unit being adapted to receive a row of row planted crop material as the machine advances and delivers the crop material to said crop conveying means when the second harvesting attachment is mounted on the main frame, said second rearwardly facing means operatively disposed adjacent said main frame transverse member under conditions where said second harvesting attachment is connected to the main frame; and

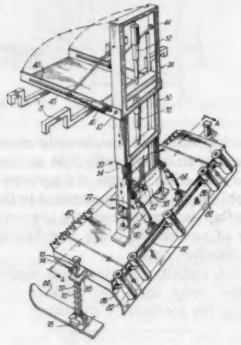
releasable locking means operatively associated with said first plurality of detachable mounting means for selectively locking either said second or third plurality of detachable mounting means thereto under conditions where said first or second harvesting attachment, respectively, is connected to said main frame.

4,202,155

AQUATIC WEED CUTTER, DE-ROOTER AND HARVESTER

Errol G. Stewart, 14 Wood St., Rockland, Ontario, Canada

Filed Jul. 3, 1978, Ser. No. 921,560
Claims priority, application Canada, Jul. 26, 1977, 282509
Int. Cl.[2] A01D *44/00*
U.S. Cl. 56—9 **11 Claims**



1. An aquatic weed cutter, de-rooter and harvester of modular construction permitting ready disassembly into modular components for ease of transport, comprising flotation means, a weed cutter and de-rooting head assembly carried by extensible framing to permit selective positioning of the head assembly with respect to the bed of a body of water, and wherein the head assembly has weed severing means provided along its forward edge and vortex generators along its rearward edge, and a vertically extensible containment chamber at least partially surrounding the head assembly, at working depth, to contain severed weeds and weed fragments.

4,202,156

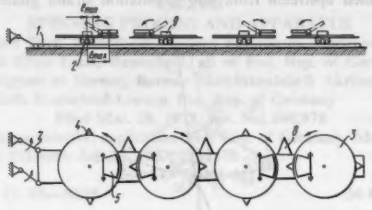
ROTARY MOWER

Anton V. Golyanovsky, proezd Solomennoi Storozhki, 8, kv. 12, Moscow, and Albert P. Kuznetsov, Dirizhabelnaya ultisa, 28, kv. 25, Dolgoprudny Moskovskaya oblast, both of U.S.S.R.

Filed Jun. 6, 1978, Ser. No. 913,070
Claims priority, application U.S.S.R., Jun. 10, 1977, 2493781[I]
Int. Cl.[2] A01D *35/264*
U.S. Cl. 56—13.6 **4 Claims**

1. In a rotary mower, a cutter-bar movable axially reciprocably in a horizontal plane, a plurality of rotatably driven cutters

mounted on said cutter-bar, means dynamically developing flywheel momentum on the cutters individually, and the last-



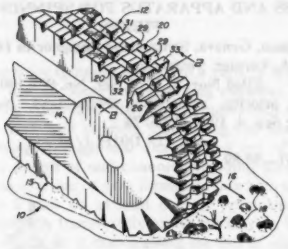
mentioned means comprising eccentric masses pivoted on the cutters.

4,202,157

SELECTIVE DOWN COTTON RETRIEVING BELT

William E. Rood, Jr., 1195 S. Idaho Rd., Apache Junction, Ariz. 85220

Filed Sep. 13, 1978, Ser. No. 941,914
Int. Cl.[2] A01D *45/18*
U.S. Cl. 56—28 **5 Claims**



1. A flexible cotton retrieving belt for use in a cotton retrieving system including an upper pulley and a lower pulley for supporting said belt, said belt comprising in combination:

a. a plurality of transverse slots disposed in spaced relationship along the outer surface of said belt for opening when said belt is flexed as said belt passes over said pulleys and closing when said belt straightens as said transverse slots move away from said pulleys; and

b. a plurality of island-like pads disposed along the outer surface of said belt, each of said island-like pads being substantially bisected by one of said transverse slots and separated from the others of said island-like pads by shallow valley-like gaps;

whereby, said island-like pads selectively close upon and grasp tufts and/or fibers of down cotton on or embedded in the ground as said belt passes around and away from said lower pulley.

4,202,158

CROP HARVESTING APPARATUS

John W. Edwards, P.O. Box 1151, Brandon, Fla. 33511

Filed Oct. 18, 1977, Ser. No. 843,177
Int. Cl.[2] A01D *46/00, 46/22*
U.S. Cl. 56—328 R **21 Claims**

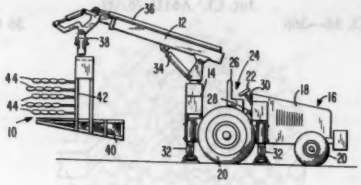
1. A crop harvesting apparatus comprising:

(a) a support plate;

(b) a plurality of crop-severing rods, each including:

(i) an elongated shaft member with a longitudinal axis and rotatably mounted on said support plate with its longitudinal axis extending substantially perpendicular to said support plate; and

(ii) a cover member formed of a plurality of discrete, separate sectional pieces, each sectional piece having a substantially circular cross-section with a diameter varying from a minimum diameter adjacent the ends of the sectional piece to a maximum diameter at substantially the longitudinal center of the sectional piece, the plurality of sectional pieces positioned on said shaft member in abutting end-to-end relationship to extend with an undulant diameter over at least a portion of the length of said shaft member for rotation therewith;



(c) drive means for rotating each crop-severing rod shaft member in a continuous uni-directional rotational movement about its longitudinal axis;

(d) a crop catcher including:

(i) a flexible body member capable of assuming a rolled position and an extended position; and

(ii) frame means mounting said flexible body member with said support plate; and

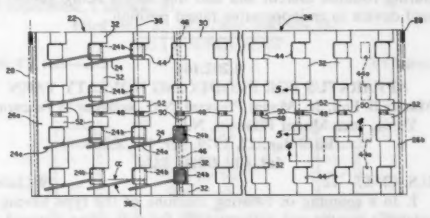
(e) control means for controlling movement of said flexible body member between its rolled position, adjacent said frame means, and its extended position, overlying an area of ground to catch crops severed from crop-bearing foliage by said crop-severing rods.

4,202,159

CONVEYOR FOR A COMBINE HARVESTER

John J. Young, Lincoln, Nebr., assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 811,404, Jun. 29, 1977, abandoned. This application May 2, 1979, Ser. No. 35,170
Int. Cl.[2] A01D *43/02, 89/00*
U.S. Cl. 56—364 **18 Claims**



1. A flexible endless conveyor for a harvester pickup apron comprising in combination:

an elastomeric belt having a reinforced base and a plurality of integrally molded elastomeric cleats, raised from the surface of the base and oriented in a plurality of rows across the width of the belt for the full length of the belt with adjacent cleats of a row interrupted by a space and an opening in the base of the belt in the area defined by the space between adjacent cleats, each of said cleats having a bore therethrough having an axis parallel to the base of the belt, the bores of cleats in a row being aligned in a direction substantially orthogonal to the lenghtwise direction of the belt;

a rod mounted in each of the rows within the bores of the cleats in a row; and

a plurality of flexible tines mounted on the rods within the openings in the base of the belt between adjacent cleats of a row, said tines each having a coiled portion having a bore through which one of said rods extends.

4,202,160

CROP WORKING MACHINE

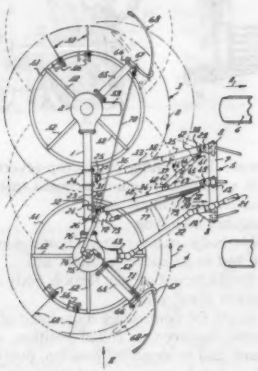
Cornelis van der Lely, 7, Brüschenrain, Zug, Switzerland

Filed Jun. 27, 1977, Ser. No. 810,614

Claims priority, application Netherlands, Jun. 29, 1976, 7607093

Int. Cl.[1] A61D *76/00*

U.S. Cl. 56—366 **36 Claims**



1. A crop working machine comprising a frame and at least one rake member being rotatable about an upwardly extending axis and supported on said frame, driving means connected to rotate said rake member, said rake member including circular rim means and tine means mounted on said rim means whereby said tine means is pivotable from a lower crop engaging position to a raised inoperative position, a tine engaging device being mounted on said frame adjacent the path described by said tine means during rotation, said device being positionable to engage said tine means in the latter's operative position during rotation thereof and said tine means being guided by said device to an inoperative raised position.

4,202,161

APPARATUS FOR PRODUCING NOVELTY YARN

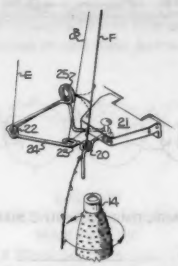
Martin B. Foil, Jr., Mount Pleasant, N.C., assignor to Tuscarora Yarns, Inc., Mount Pleasant, N.C.

Filed Jan. 22, 1979, Ser. No. 5,205

Int. Cl.[2] D02G *3/34*

U.S. Cl. 57—12 **19 Claims**

1. In a spinning or twisting machine of the type having a rotatable spindle and delivery rolls for delivering a strand to the spindle for being wound to form a package, and said machine having a strand guide carried by a strand guide support and positioned for guiding the strand in its path of travel from the delivery rolls to the spindle, and wherein the strand is adapted to serve as a foundation strand in the production of a novelty yarn therefrom, the combination therewith of auxiliary strand guide means also carried by said support and adapted for guiding respective effect and binder strands onto the advancing foundation strand for becoming wound thereabout to produce a novelty yarn, said auxiliary strand guide means comprising a guide for the effect strand positioned upstream from said guide for the foundation strand and laterally offset from the path of travel of the foundation strand and adapted for guiding the effect strand onto the advancing foundation strand while allowing the effect strand to move in an oscillating manner along the advancing foundation strand and to become wound thereabout, and a guide for the binder strand positioned upstream from said foundation strand guide and



downstream from said effect strand guide and also being laterally offset from the path of travel of the advancing foundation strand and adapted for guiding the binder strand onto the advancing foundation and effect strands for binding the effect strand to the underlying foundation strand.

4,202,162

PROCESS AND APPARATUS FOR SPINNING TEXTILE FIBRES

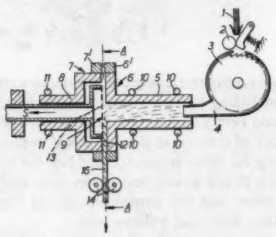
Louis Vignon, Geneva, Switzerland, assignor to Heberlein Hispano SA, Vernier, Switzerland

Filed Nov. 8, 1978, Ser. No. 959,190

Claims priority, application Switzerland, Nov. 9, 1977, 13652/77; Sep. 4, 1978, 9696/78

Int. Cl.[2] D01H *1/12*

U.S. Cl. 57—58.89 **9 Claims**



1. A process for spinning textile fibres, in which the fibres are transported in a gas stream to a gas permeable collecting surface having a defined suction zone located between a pair of substantially parallel closely spaced rotary friction discs, at least part of the gas stream is caused to pass through the said gas permeable collecting surface, the fibres are angularly diverted from the direction of the gas stream flowing through the collecting surface, the fibres being fed into the gap between the discs, the discs are rotated in opposite directions and the fibres are mechanically twisted thereby, and drawn off in yarn form.

2. Apparatus for spinning textile fibres comprising a guide duct, means for feeding fibres in a gas stream through said duct, a gas permeable collecting surface with a suction zone located adjacent the exit from said duct, a twisting device comprising two closely spaced rotary friction discs and means for causing rotation of said discs in opposite directions, each disc having a central opening, the opening in one disc communicating with said guide duct while the opening in the other disc provides a gas exit opening for gas passing through said

suction zone, the gap between said discs providing an exit for the fibres which are twisted thereby into the form of a yarn.

4,202,163

SPINNING PROCESS AND APPARATUS

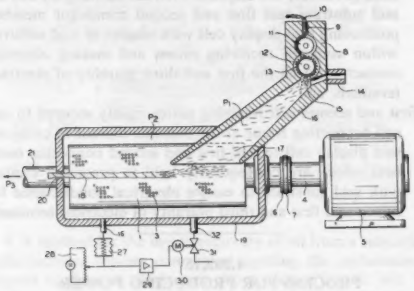
Herbert Turk, Remscheid; Herbert Schiminski, Huckeswagen, and Erich Lenk, Remscheid, all of Fed. Rep. of Germany, assignors to Barmag Barmer Maschinenfabrik Aktiengesellschaft, Remscheid-Lennep, Fed. Rep. of Germany

Filed Mar. 28, 1978, Ser. No. 890,978

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1977, 2714089; Jul. 20, 1977, 2732678

Int. Cl.[2] D01H *1/12*

U.S. Cl. 57—58.95 **30 Claims**



1. In a process for spinning fibers into a yarn by the steps of introducing a tow of fibers into a carding chamber having a rotating carding roller and discharging individual, separated fibers into a fiber feed channel, conveying the fibers in an airstream flowing through said channel and out of an elongated, narrow mouth of said channel extending parallel with and contiguous to a line of yarn formation in which said fibers are spun into a yarn on at least one air permeable surface moving substantially transversely to the line of yarn formation and through which air is drawn along the line of yarn formation by suction means, the improvement wherein an air pressure gradient is maintained so that the static air pressure decreases in cascade fashion such that

$$P_W > P_1 > P_2 > P_3 < P_0,$$

wherein

P_W is a superatmospheric pressure in the carding chamber,

P_1 is the air pressure in the channel,

P_2 is the air pressure in the free flight interval of the individual fibers between the mouth of the channel and the line of yarn formation, P_2 being equal to or less than P_0,

P_3 is the air pressure in the suction means, and

P_0 is the atmospheric air pressure.

7. In an apparatus for spinning of individual fibers into a yarn along a line of yarn formation including hollow, air permeable, rotating roller means containing suction means into which a current of air is drawn to form said line of yarn formation extending longitudinally along the roller means, fiber feed channel means for conveying a stream of said fibers through a channel mouth extending along and adjacent to said line of yarn formation, the improvement comprising carding means to receive a tow of fibers and separate it into the individual fibers, said carding means embodying a rotatably driven carding roller with projections on its circumference in a carding chamber communicating with said channel for discharge of separated fibers into the channel, a pressurizable casing forming a substantially airtight chamber about said carding means, tow passage means extending through said casing for feed of a tow of entangled fibers to said carding means, seal means to seal the tow passage means substantially against leakage of pressurized air, and air passage means in said carding means for flow of pressurized air from said casing through said carding means into said channel.

4,202,164

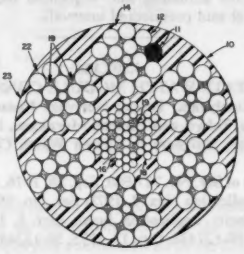
LUBRICATED PLASTIC IMPREGNATED ARAMID FIBER ROPE

Neville H. Simpson, and Fred E. Dykeman, both of Kenosha, Wis., assignors to Amsted Industries Incorporated, Chicago, Ill.

Filed Nov. 6, 1978, Ser. No. 958,339

Int. Cl.[2] D07B *1/16, 5/00;* D02G *3/36*

U.S. Cl. 57—232 **2 Claims**



1. A rope comprising a central core, said central core being comprised of a plurality of aramid fiber strands laid around a central core strand, said strands being lubricated with a heavy, viscous lubricant, a plurality of aramid fiber outer strands laid around said central core, said strands being equally spaced from each other and lubricated with a heavy, viscous lubricant,

and a flexible thermoplastic material filling the space between said central core and said outer strands and between adjacent outer strands to retain the lubricant in said strands and to keep said outer strands in a fixed position relative to each other,

said thermoplastic material extending outwardly to the outer periphery of said outer strands.

4,202,165

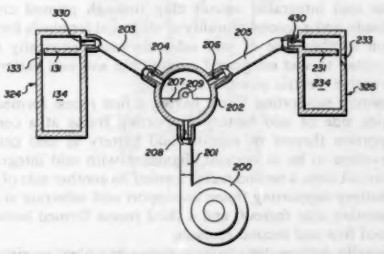
BELLOWLESS CUCKOO CLOCK

Christian M. J. Jauch, Louisville, Miss., assignor to Spartus Corporation, Chicago, Ill.

Filed Dec. 27, 1977, Ser. No. 864,255

Int. Cl.[2] G04B *21/08*

U.S. Cl. 368—272 **3 Claims**



1. In a cuckoo clock having a clock mechanism, a cuckoo whistle actuable to produce the cuckoo sound and having entry and exit openings, bellowless mechanical means for actuating said cuckoo whistle, and linking means connecting said bellowless mechanical means to said clock mechanism for automatically actuating the bellowless mechanical means at

preselected intervals determined by said clock mechanism, said bellowless mechanical means comprising:

an air blower;

a valve housing having an entry port communicating with said blower and an exit port communicating with the entry opening of said cuckoo whistle;

a shutter within said valve;

and means mounting said shutter for sequential movement within said housing from a first position in which said shutter closes said entry port to an intermediate position in which neither the entry port nor the exit port is closed by the shutter to a final position in which the exit port is closed by the shutter;

said linking means comprising means connected to said shutter for actuating said sequential movement by the shutter at said preselected intervals.

4,202,166

SOLID STATE WATCH MODULE CONSTRUCTION

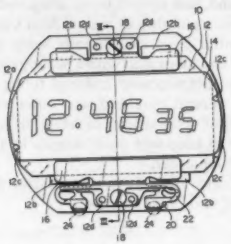
Katsuhiko Komiyama, Tokyo; Noriyuki Kasama, Hino; Keiji Tsukamoto, Tokyo, and Tomomi Murakami, Higashi-Yamato, all of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 727,500, Sep. 28, 1976, abandoned. This application Nov. 7, 1978, Ser. No. 958,580

Claims priority, application Japan, Oct. 1, 1975, 50-118599; Oct. 7, 1975, 50-121136; Oct. 13, 1975, 50-122489; Oct. 21, 1975, 50-125971

Int. Cl.[2] G04B *19/30*; G04C *3/00*

U.S. Cl. 368—82 **5 Claims**



1. A solid state watch module construction having a battery, comprising:

a ceramic substrate having an integrated circuit chip mounted on one side of said substrate at a centrat portion thereof and providing drive signals indicative of time information, a first plurality of electrical terminals formed on the one side of said substrate and electrically connected to said integrated circuit chip through printed circuit leads, and a second plurality of electrical terminals formed on another side of said substrate and electrically connected to said integrated circuit chip and said battery to receive electric power therefrom;

a battery supporting frame having a first recess formed on one side of said battery supporting frame at a central portion thereof to support said battery at said central portion to be in vertical alignment with said integrated circuit chip, a second recess formed on another side of said battery supporting frame to support said substrate at said another side thereof, and a third recess formed between said first and second recesses;

a metallic intermediate battery supporting plate received in the third recess of said battery supporting frame and overlying said another side of said substrate, said battery supporting plate serving as shock absorbing means to prevent said battery from being brought into direct contact with said substrate when said module construction is subject to external shocks;

an electro-optical display cell responsive to said drive signals to provide a display of said time information and having a third plurality of electrical terminals;

a cell suppporting frame having a substrate retaining recess formed at one side of said cell supporting frame to position said substrate relative to said display cell, said cell supporting frame being fixedly secured to said battery supporting frame to retain said substrate between said substrate receiving recesses of said battery supporting frame and said cell supporting frame, and said cell supporting frame having a cell receiving recess formed on another side of said cell supporting frame at a central portion thereof to receive said display cell at a position opposing to said battery with respect to said substrate;

first and second connector members made of electrical conductive rubber, and disposed between said display cell and said substrate said first and second connector members positioning said display cell with respect to said substrate within said cell receiving recess and making electrical contact between the first and third plurality of electrical terminals; and

first and second cell retaining plates rigidly secured to said cell supporting frame at the one side thereof to compress said display cell to said first and second connector members which are consequently held in pressured contact with said substrate to ensure electrical conductance between said first and third plurality of electrical terminals.

4,202,167

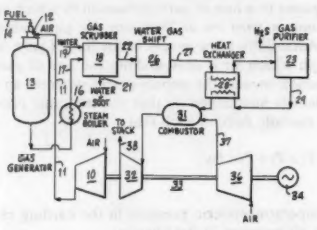
PROCESS FOR PRODUCING POWER

Robert M. Suggitt, Wappingers Falls; William N. Gilmer, Patterson, both of N.Y., and George N. Richter, San Marino, Calif., assignors to Texaco Inc., White Plains, N.Y.

Filed Mar. 8, 1979, Ser. No. 18,820

Int. Cl.[2] F02C *3/22*

U.S. Cl. 60—39.02 **5 Claims**



1. In a method for the generation of power wherein a nickel-containing carbonaceous or hydrocarbonaceous liquid or solid fuel is gasified by partial oxidation with oxygen-containing gas at an elevated temperature and pressure producing hot raw fuel gas comprising carbon monoxide and hydrogen admixed with nitrogen and carbon dioxide, the improvement which comprises cooling said hot raw fuel gas with the production of steam and expanding the so-produced steam in a heat engine with the production of power, passing said cooled raw fuel gas now containing nickel carbonyl in admixture with added steam or water vapor into contact with a water gas shift reaction catalyst at elevated pressure and a temperature above about 315° C. effecting decomposition of nickel carbonyl and removal of nickel from the fuel gas stream and also effecting conversion of at least a portion of said carbon monoxide and steam in said fuel gas to carbon dioxide and hydrogen, thereby producing a fuel gas enriched in hydrogen and carbon dioxide, and subjecting said hydrogen and carbon dioxide-enriched fuel gas to substantially complete combustion and expansion of the products of combustion in a heat engine with the generation of power.

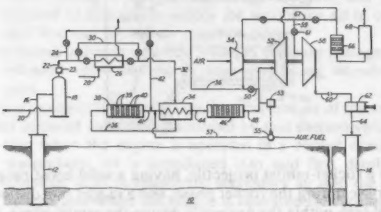
4,202,168
METHOD FOR THE RECOVERY OF POWER FROM LHV GAS

Willard P. Acheson, Pittsburgh, Pa.; Richard A. Morris, Missouri City, Tex.; Raymond J. Rennard, Pittsburgh, and Thiagarajan Viswanathan, Allison Park, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 791,850, Apr. 28, 1977, abandoned. This application Jul. 18, 1878, Ser. No. 925,703

Int. Cl.[2] F02C *3/22, 7/22*

U.S. Cl. 60—39.06 **24 Claims**



1. A method for the in-situ recovery of oil from a subsurface carbonaceous deposit comprising igniting the carbonaceous deposit to form a combustion front, delivering air into the carbonaceous deposit under pressure and displacing it through the combustion front to burn a portion of the carbonaceous deposit and drive oil and LHV gas ahead of the combustion front, delivering produced oil and LHV gas to the surface, mixing air with the LHV gas and passing the mixture in contact with an oxidation catalyst to oxidize combustibles in the LHV gas to produce hot combustion products, the amount of air mixed with the LHV gas being less than the stoichiometric equivalent of the combustibles in the LHV gas and limiting the maximum temperature reached on oxidation to the maximum operating temperature of the catalyst, generating power with the hot combustion products from the oxidation, and driving a compressor with power generated to compress the air delivered into the carbonaceous deposit.

4,202,169
SYSTEM FOR COMBUSTION OF GASES OF LOW HEATING VALUE

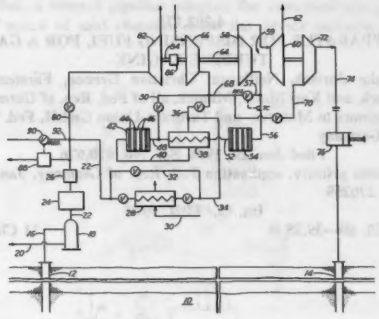
Willard P. Acheson, Pittsburgh, Pa.; Richard A. Morris, Missouri City, Tex., and Thiagarajan Viswanathan, Allison Park, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 791,850, Apr. 28, 1977, abandoned, and a continuation-in-part of Ser. No. 925,703, Jul. 18, 1978. This application Aug. 3, 1978, Ser. No. 930,557

Int. Cl.[2] F02C *3/22;* **F02C** *7/22*

U.S. Cl. 60—39.12 **16 Claims**

1. Apparatus for the recovery of power from LHV gas discharged from an in-situ combustion process comprising a gas turbine, an air compressor driven by the gas turbine, an external combustor for burning the LHV gas, said combustor comprising a first stage catalytic combustion chamber and a second stage catalytic combustion chamber, a heat exchanger between the first stage catalytic combustion chamber and the second stage catalytic combustion chamber connected to deliver products of combustion discharged from the first stage catalytic combustion chamber through the heat exchanger to the second stage catalytic combustion chamber, LHV gas conduit means to the heat exchanger for delivering the LHV gas from the in-situ combustion process to the heat exchanger, said heat exchanger being constructed and arranged for passing the LHV gas in indirect heat exchange with the products of combustion from the first stage catalytic combustion chamber, conduit means from the heat exchanger to the inlet of the first stage catalytic combustion chamber, said conduit means communicating through the heat exchanger with the LHV gas conduit means for delivery of LHV gas to the first stage catalytic combustion chamber, hot gas conduit means from the outlet of the second stage catalytic combustion chamber to the



gas turbine for delivery of hot products of combustion to the gas turbine, and air conduit means from the air compressor connected for supplying compressed air to the LHV gas before entrance to the first stage catalytic combustion chamber and to gas delivered to the second stage catalytic combustion chamber.

4,202,170
COMBUSTION CHAMBER FOR GAS TURBINES

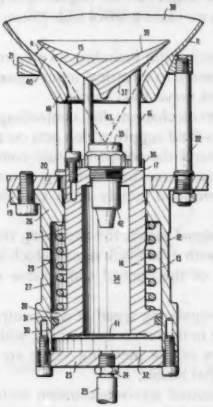
Franz-Josef Meyer, Marbach, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 29, 1977, Ser. No. 865,727

Claims priority, application Fed. Rep. of Germany, Dec. 29, 1976, 2659351

Int. Cl.[2] F02C *7/22, 9/14*

U.S. Cl. 60—39.23 **8 Claims**



1. A combustion chamber for gas turbines of the type having a variable inlet cross-section for primary air comprising:

(a) a turbine combustion chamber inlet means for admitting a supply of fuel and primary air to a turbine combustion chamber;

(b) a fuel injection nozzle means for injecting fuel through said inlet means;

(c) fuel supply means for supplying fuel to said nozzle means;

(d) inlet adjustment means exposed to fuel pressure in said supply means for adjusting the cross-sectional area of said inlet means so as to achieve a matching of primary air quantity to fuel quantity supplied to the combustion chamber in dependence upon said fuel pressure.

4,202,171

APPARATUS FOR DISPENSING FUEL FOR A GAS TURBINE ENGINE

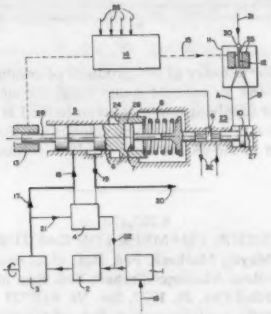
Wilhelm Jurisch, Nellingen; Christian Greune, Fürstenfeldbruck, and Karl Maier, Munich, all of Fed. Rep. of Germany, assignors to Motoren- und Turbinen-Union GmbH, Fed. Rep. of Germany

Filed Jan. 19, 1978, Ser. No. 870,676

Claims priority, application Fed. Rep. of Germany, Jan. 22, 1977, 270259

Int. Cl.[2] F02C 9/08

U.S. Cl. 60—39.28 R **11 Claims**



1. Fuel dispensing apparatus for dispensing fuel for a gas turbine engine comprising:

a fuel metering slide valve which directly controls the supply of fuel to a gas turbine engine in dependence on the position of a movable control slide piston of said metering slide valve,

a first servo-mechanism including an electro hydraulic converter responsive to electrical input signals to control the flow of a first servo-fluid supply,

a second servo-mechanism for controlling the flow of a second servo-fluid supply which acts on the control slide piston to control the position of said control slide piston, said second servo-mechanism being in turn controlled by the first servo-fluid supply from said first servo-mechanism,

and feedback signal means for supplying the second servo-mechanism with a feedback signal which is the function of the position of the control slide piston of the metering valve,

whereby high regulating speed of said control slide piston is obtained due to the servo-mechanism, while instabilities in the operation of the metering valve are limited by the feedback signal means,

wherein said second servo-mechanism includes a movable auxiliary control slide piston which controls the flow of the second servo-fluid supply to said control slide piston, and wherein the feedback signal means includes means for supplying a feedback signal which is proportional to the distance between, and the related velocities of, the control slide piston and the auxiliary control slide, piston, and

wherein said feedback signal means includes fluid in a common chamber contacted by respective facing pressure faces of said control slide piston and said auxiliary control slide piston.

4,202,172

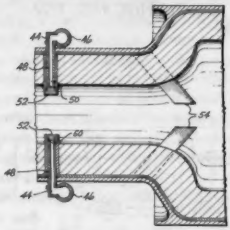
BOOST SURVIVABLE RAMJET ELEMENTS

Dietrich W. Brunner, Kent, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Mar. 1, 1976, Ser. No. 662,983

Int. Cl.[2] F02K 7/10

U.S. Cl. 60—245 **1 Claim**



1. In a rocket-ramjet projectile, having a solid boost propellant for use during the rocket phase, and a ramjet fuel disposed in a fuel tank within the projectile during the ramjet phase, the solid boost propellant disposed in a chamber, the chamber functioning as a combustor once the solid boost propellant is exhausted, the combustion comprising:

(a) injector means communicating with the ramjet fuel or injecting ramjet fuel into combustor after the solid boost propellant is exhausted;

(b) flameholding means mounted to the projectile in the rammed air stream for producing a stabilized flame front in the combustor during ramjet operation;

(c) a graphite slip-on cover associated with said injector means and said flameholding means for protecting said injecting means and flameholder means from high temperatures during the burning of the solid boost propellant, said graphite slip-on cover being removable after the substantial burnout of the solid boost propellant.

4,202,173

SECONDARY AIR SUPPLYING DEVICE OF AN INTERNAL COMBUSTION ENGINE

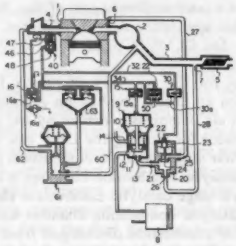
Nobuaki Wakita, and Kohei Igarashi, both of Susono, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jun. 8, 1978, Ser. No. 913,885

Claims priority, application Japan, Mar. 22, 1978, 53-31686

Int. Cl.[2] F01N 3/10

U.S. Cl. 60—290 **1 Claim**



1. A secondary air supplying device of an internal combustion engine having an exhaust manifold, and an exhaust passage provided with a catalyzer for purifying exhaust gas which flows therein, said device comprising:

first air injection means having a first air injection port in

said exhaust passage upstream of the exhaust manifold of the engine;

second air injection means having a second air injection port in said exhaust passage upstream of said catalyzer;

an air pump for supplying secondary air;

a first vacuum pressure passage;

a second vacuum pressure passage;

a third vacuum pressure passage fluidly connected in parallel with said second vacuum pressure passage;

a first air changing means connected to said air pump and comprising a first pneumatic valve having a first diaphragm chamber connected to the intake manifold through said first vacuum pressure passage;

a second air changing means comprising a second pneumatic valve having a second diaphragm chamber and being adapted to selectively supply the secondary air to one of said first and second air injection ports;

a solenoid valve in said first vacuum pressure passage, said solenoid valve having an atmospheric air introduction port;

a thermo-switch for detecting the temperature of the engine;

said solenoid valve being actuated by said thermo-switch so that when the engine is operated in a cooled condition, atmospheric air is introduced into said first diaphragm chamber so as to release the secondary air into the atmosphere, and when the engine is operated in warming and warmed up conditions, intake manifold vacuum pressure is introduced into said first diaphragm chamber so as to supply the secondary air to said second air changing means;

said second diaphragm chamber being connected to the intake manifold by means of said second vacuum pressure passage and said third vacuum pressure;

a vacuum pressure changing switch in said second vacuum pressure passage, said vacuum pressure changing switch having an atmospheric air introduction port and a sensor for detecting the temperature of engine cooling water, so that when the engine is operated in a warming condition, atmospheric air is transmitted to said second diaphragm chamber so as to supply the secondary air to said first air injection port, and when the engine is operated in a warmed up condition, the intake manifold vacuum pressure is transmitted to said second diaphragm chamber, so as to supply the secondary air to said second air injection port;

a pressure delay valve by which vacuum pressure is maintained in said second diaphragm chamber during a predetermined time interval after the intake manifold vacuum pressure is reduced when the engine is in a high load operating condition, said pressure delay valve being in said second vacuum pressure passage; and

a vacuum pressure introduction valve through which vacuum pressure is temporarily transmitted to said second diaphragm chamber, so as to supply the secondary air to said second air injection port when the intake manifold vacuum pressure is abruptly increased, said vacuum pressure introduction valve being in said third vacuum pressure passage.

4,202,174

HYDRAULIC DRIVE

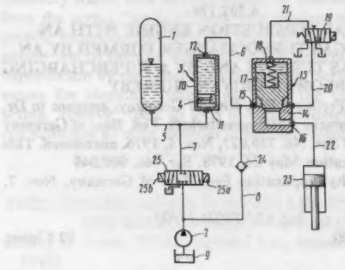
Anatoly S. Grigorenko, ulitsa Tovstukho, 1, kv. 21; Jury A. Moroz, ulitsa Fugenfirova, 11, kv. 91; German N. Kuznetsov, ulitsa Romanenko, 8, kv. 46; Vladimir I. Vimba, ulitsa 50 let VLKSM, 4-v, kv. 55; Vladimir V. Landyshev, ulitsa 50 let VLKSM, 14-a, kv. 22, all of Omsk; Jury A. Bocharov, 15 Parkovaya, 18, korpus 1, kv. 109, and Anatoly V. Safonov, Sevastopolsky prospekt, 51, korpus 1, kv. 11, both of Moscow, all of U.S.S.R.

Filed May 16, 1978, Ser. No. 906,621

Int. Cl.[2] F15B *1/02*

U.S. Cl. 60—413 **3 Claims**

1. A hydraulic drive comprising a gas-hydraulic accumulator in the form of a container filled with a service fluid and gas for maintaining a preset pressure in said container, a reservoir holding a supply of service fluid, a pump for transferring the service fluid from said reservoir, a chamber for the service fluid whose volume is equal to at least the consumption of fluid by a working stroke of a device utilizing said drive, said chamber being divided by a piston into two spaces, a first pipeline for communicating said accumulator with one space of said chamber, a second pipeline adapted for communicating the other space of said chamber with the device utilizing said



drive, said second pipeline being provided with a closing device for cutting off the supply of fluid to the device, a distributing device for controlling the opening and closing of said closing device, a third pipeline for communicating said pump with said other space of the chamber, a nonreturn valve installed in said third pipeline, a fourth pipeline communicating with said first pipeline and with the pump and intended to supply the service fluid from the reservoir into the accumulator.

4,202,175

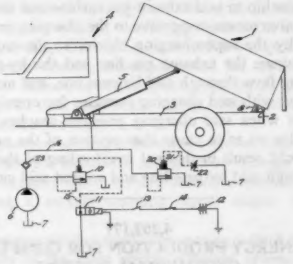
HYDRAULIC CONTROL SYSTEM FOR A DUMP TRUCK

John D. Hale, and Frank L. Hale, both of P.O. Box 11, Swisshome, Oreg. 97480

Continuation-in-part of Ser. No. 796,741, May 13, 1977, abandoned. This application Oct. 2, 1978, Ser. No. 947,443

Int. Cl.[2] F15B *15/18*

U.S. Cl. 60—477 **9 Claims**



1. A hydraulic dump body control system, said system comprising,

a pump,

a hydraulic lift cylinder coupled to a truck dump body and in communication with said pump,

a first relief valve of a remote pilot operated type in upstream communication with said pump,

a directional control valve of a solenoid actuated type in piloting communication with said first relief valve piloting the last mentioned valve to a closed position for pressurization of said cylinder by said pump and alternatively piloting same open for unloading of pump output to a

reservoir, a control circuit for said directional control valve including an operator actuated switch,

a second relief valve also of a remote pilot operated type in fluid communication with said cylinder, and

a manually adjustable flow control valve in piloting communication with said second relief valve to permit manually controlled exhausting of fluid from said cylinder to a reservoir and hence lowering of the dump body in a controlled manner.

4,202,176

INTERNAL COMBUSTION ENGINE WITH AN EXHAUST GAS TURBOCHARGER FORMED BY AN EXHAUST GAS TURBINE AND BY A SUPERCHARGING BLOWER DRIVEN THEREBY

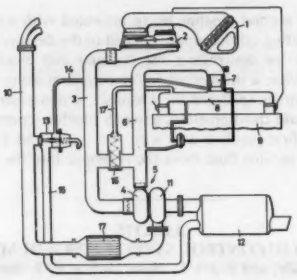
Hans Mezger, Freiberg, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 739,027, Nov. 4, 1976, abandoned. This application May 24, 1978, Ser. No. 909,049

Claims priority, application Fed. Rep. of Germany, Nov. 7, 1975, 2549934

Int. Cl.[2] F02B *37/00*

U.S. Cl. 60—600 **12 Claims**



1. An internal combustion engine with an exhaust-gas line, an exhaust-gas turbo-charger including an exhaust-gas turbine in said exhaust-gas line and a supercharging blower driven by the exhaust-gas turbine, a catalyst in said exhaust-line, an auxiliary by-pass line branching off said exhaust-gas line in by-passing relationship to said exhaust-gas turbine and said catalyst, a control valve means responsive to the charging pressure of air supplied by the supercharging blower to the engine and located between the exhaust gas line and the by-pass line for controlling flow through said by-pass line, and means in communication with said charging pressure for opening said control valve when said charging pressure reaches a predetermined value so as to cause that portion of the exhaust gases which could result in thermal overloading of the catalyst to flow through said by-pass line and around said catalyst.

4,202,177

ENERGY PRODUCTION FOR COMPLEX GEOTHERMAL WATERS

Donald E. Garrett, 110 N. Bristol St., Ojai, Calif. 93023

Filed May 5, 1977, Ser. No. 794,080

Int. Cl.[2] F03G *7/00*; F01K *25/08*

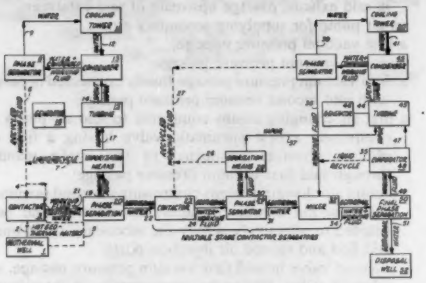
U.S. Cl. 60—641 **34 Claims**

1. A method for utilizing geothermal fluid from a well as a source of energy to produce work, the method comprising the steps of:

effecting an initial contact within the confines of said well between the geothermal fluid and an immiscible working fluid for a sufficient residence period to effect a heat transfer from the geothermal fluid to the working fluid;

flowing the resultant geothermal fluid-working fluid mixture to the surface;

separating the heated working fluid from substantially all the geothermal fluid;



rapidly varporizing the working fluid and utilizing the resulting vapors to operate a mechanical working device to produce work.

4,202,178

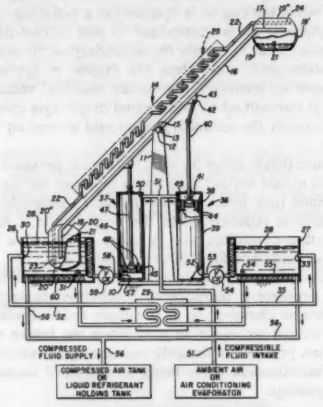
LOW-BOILING LIQUID APPARATUS

Paul L. Peterman, Rte. 1, Box 161; S. F. Peterman, Rte. 2, Box 33, and Henry D. Waldrep, P.O. Box 372, all of Celina, Tex. 75009

Filed Jun. 23, 1978, Ser. No. 918,500

Int. Cl.[2] F03G *3/00*; F01K *25/00*

U.S. Cl. 60—675 **14 Claims**

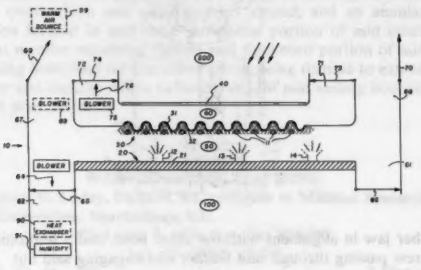

COMPRESSED FLUID SUPPLY
COMPRESSIBLE FLUID INTAKE
COMPRESSED AIR TANK OR LIQUID REFRIGERANT HOLDING TANK
AMBIENT AIR OR AIR CONDITIONING EVAPORATOR

1. A thermodynamic motor powered fluid compression apparatus, comprising a centrally pivotable arm member, liquid holding tank means affixed to respective opposite end extremes of said arm member, a fluid communication means extending between said liquid holding tank means, with said tank means and fluid communication means comprising a closed system, a low-boiling liquid supply contained in said closed system, first and second water holding tank means into which respective ones of said liquid holding tank means are immersible by pivot action of said arm member; fluid compression means, drive means connected between said pivotable arm member and said fluid compression means, and heat exchanging means communicating with said fluid compression means and said water holding tank means whereby heat of compression is transferred into said water holding tank means.

4,202,179
SOLAR AIR CONDITIONING APPARATUS AND METHOD

Edwin F. Shelley, New Rochelle, N.Y., assignor to New York Institute of Technology, Old Westbury, N.Y.

Filed Jun. 13, 1977, Ser. No. 805,919
Int. Cl.[2] F25B *27/00*
U.S. Cl. 62—2 **16 Claims**

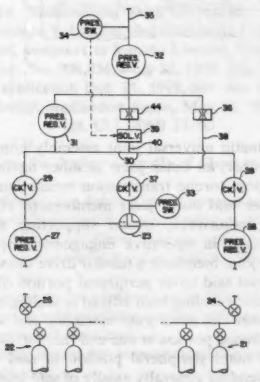


1. Apparatus for drying and/or cooling internal environment air using solar energy, comprising:
a central member having top and bottom surfaces, said top surface being radiation-absorbing;
a top member, which is substantially transmissive of solar radiation, disposed above the top surface of said central member and spaced therefrom so as to define a first air chamber as between said central and top members;
a bottom member disposed below the bottom surface of said central member and spaced therefrom so as to form a second chamber;
a desiccant disposed in said second chamber;
auxiliary heating elements disposed in contact with said desiccant and adapted to heat-dry said desiccant;
means for energizing said auxiliary heating elements when solar energy is insufficiently present; and
means for periodically circulating internal environment air through said second chamber.

4,202,180
LIQUEFIED GAS SUPPLY SYSTEM

Frank H. Cox, Avon Lake, Ohio, assignor to The Scott & Fetzer Company, Cleveland, Ohio

Filed Oct. 13, 1978, Ser. No. 950,995
Int. Cl.[2] F17C *7/02*
U.S. Cl. 62—50 **13 Claims**

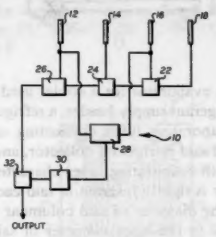


1. In a liquefied gas supply system having first and second supply banks and means for replacing spent banks with fresh supply banks and in which system the first and second supply banks alternate in the roles of "service" supply and "reserve" supply to a downstream line fed through a line pressure regulator, and resetting means is provided for effecting the exchange of such roles upon replacement of the supply bank which has most recently been acting as "service" supply, and in which system the bank acting as "service" supply tends to become relatively cold under moderate or relatively high flow demands and the bank acting as "reserve" supply tends to remain relatively warm, flow limiting means for limiting the flow rate from the acting "service" bank to a predetermined level not greatly exceeding the average flow demand of said downstream line to thereby limit the rate of absorption of heat-of-vaporization by the relatively cold acting "service" bank, and means for bleeding makeup gas from the relatively warm acting "reserve" bank so long as such predetermined level is not sufficient to meet demand in said downstream line.

4,202,181
FUEL CONSERVATION CONTROLLER FOR HEATING AND REFRIGERATION APPARATUS

Jeffrey W. Lamb, 172-41 Highland Ave., Jamaica Estates, N.Y. 11432

Continuation-in-part of Ser. No. 779,735, Mar. 21, 1977, Pat. No. 4,090,372. This application May 22, 1978, Ser. No. 908,109
Int. Cl.[2] F25B *15/00*
U.S. Cl. 62—141 **5 Claims**



1. A controller for reducing the energy consumption of a closed, variable capacity system of the type used for modifying the climate of an area remote from the system, said system including means for varying the energy input to the system for varying the capacity thereof, said controller comprising:
first parameter sensing means disposed for sensing a first parameter indicative of the actual capacity of the system at any given time and for providing a first tracking signal output indicative thereof;
second parameter sensing means disposed for sensing a second parameter indicative of the most energy efficient system capacity based on said second parameter and for providing a second tracking signal output indicative thereof;
third parameter sensing means for sensing a third parameter indicative of the most energy efficient system capacity based on said third parameter and for providing a third tracking signal output indicative thereof;
means operatively connected to said second and third tracking signal outputs for comparing said second and third tracking signals, selecting the one indicative of the most energy efficient system capacity and for providing a first control signal output indicative of said one tracking signal;
means operatively connected to said first tracking signal output and said first control signal output for comparing said first tracking signal indicative of said actual system capacity with said first control signal indicative of said most energy efficient system capacity and for providing a second control signal output indicative of the change in

energy input necessary to adjust said actual system capacity to said most energy efficient capacity; and

means operatively connected to said second control signal output and responsive to said second control signal for controlling said capacity varying means to effect said change.

4,202,182

MULTI-TUBE EVAPORATOR FOR A COOLER USED IN AN AUTOMOBILE

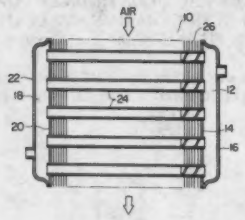
Kenichi Kawashima, Hitachi; Yosiaki Arima, Taga; Yoshihide Endo, Katsuta; Atsushi Suginuma; Akira Uenishi, both of Mito, and Seigo Miyamoto, Takahagi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed May 3, 1978, Ser. No. 902,497

Claims priority, application Japan, May 10, 1977, 52-53473

Int. Cl.[2] F25B *41/06*

U.S. Cl. 62—511 **5 Claims**



1. A multi-tube evaporator for a cooler used in an automobile having a refrigerant supply header, a refrigerant collector, a plurality of evaporating tubes connecting said refrigerant supply header and said refrigerant collector, and a plurality of fins associated with evaporating tubes characterized in that a columnar member is tightly inserted in said each evaporating tube at its inlet, the diameter of said columnar member being substantially equal to the inner diameter of said evaporating tube, and capillary means being engraved as a spiral groove on the surface of said columnar member for passing refrigerant from said refrigerant supply header into each evaporating tube by capillary action with a reduction in the pressure of the refrigerant as it passes therethrough, whereby the refigerant is uniformly distributed into the evaporating tubes.

4,202,183

GEAR COUPLING

Michael Fröhlich, Kirchheim-Teck, and Walter Stähle, Uhingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

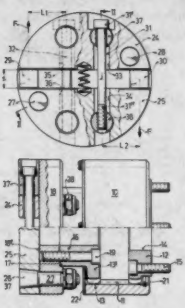
Filed Aug. 26, 1977, Ser. No. 828,226

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1976, 2643784

Int. Cl.[2] F16C *3/00*

U.S. Cl. 64—1 C **4 Claims**

1. In a toothed coupling including a coupling bushing with internal teeth, a first ring gear with convex external teeth in mesh with a portion of the internal teeth of the bushing and a second ring gear with convex external teeth in mesh with another portion of the internal teeth of the bushing, a combination comprising a support disk secured to one of said ring gears, a pair of facing clamp jaws journalled for rotation on said support disk at diametrically opposed pivot points; connecting means disposed between the end portions of said jaws; and tensioning means engaging said jaws between said pivot points for substantially radially forcing said jaws against said connecting means, said tensioning means including aligned bores in said jaws, a rotary washer seated on one jaw in alignment with one of said bores, a rotary nut supported on the other jaw in alignment with the other bore, and a tensioning screw passing through said washer and engaging said nut.



4,202,184

HOMOKINETIC UNIVERSAL JOINT ASSEMBLY

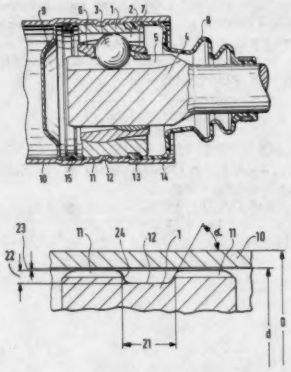
Werner Krude, Neunkirchen, and Alfons Jordan, Hennef, both of Fed. Rep. of Germany, assignors to Uni-Cardan Aktiengesellschaft, Lohmar, Fed. Rep. of Germany

Filed Aug. 23, 1978, Ser. No. 935,876

Claims priority, application Fed. Rep. of Germany, Sep. 7, 1977, 2740226

Int. Cl.[2] F16D *3/84, 3/30*

U.S. Cl. 64—32 R **4 Claims**



1. A homokinetic universal joint assembly comprising: an inner joint member; an outer joint member having an outer peripheral portion; torque transmission means interposed between said inner and outer joint members to effect torque transmission therebetween; means supporting said torque transmission means in operative engagement between said inner and outer joint members; a tubular drive sleeve locked in engagement about said outer peripheral portion of said outer said joint member; a sealing boot affixed in sealing engagement between said inner and outer joint members, said sealing boot including a thickened portion at one end thereof; axial grooves formed in said outer peripheral portion of said outer joint member and extending generally axially of said joint assembly; at least one annular groove formed in said outer peripheral portion of said outer joint member extending circumferentially

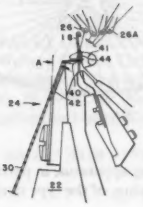
thereof transversely of said axial grooves; said tubular drive sleeve being shaped to conform with the configuration of said axial grooves and said at least one annular groove to lock said tubular drive sleeve in fixed engagement relative to said outer joint members; said axial grooves being uniformly distributed over said outer peripheral portion, said at least one angular groove having a depth which is greater than the depth of said axial grooves and being arranged at approximately the midpoint of said outer peripheral portion of said outer joint member over which said axial grooves extend; and an annular recess formed in said outer peripheral portion of said outer joint member receiving therein said thickened portion of said sealing boot, said tubular drive sleeve being formed to extend over said annular recess to fixedly mount said sealing boot on said joint assembly.

4,202,185

WARP KNITTING MACHINE

Bascum G. Lesley, Pickens, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed Oct. 5, 1978, Ser. No. 948,787
Int. Cl.[2] D04B *23/00*
U.S. Cl. 66—203 **5 Claims**



1. A trick-sinker for a warp knitting machine comprising: a trick-sinker support member, a trick sinker band mounted on one side of said trick-sinker support and a plurality of thin plate members spaced from another to accommodate a knitting needle between adjacent plate members and connected to said trick-sinker support member on the side thereof away from said trick sinker band, each of said thin plate members having a sinker throat closely adjacent the top of said trick sinker band and opening towards said trick sinker band.

4,202,186

APPARATUS FOR DYEING A BUNDLE OF FIBERS SUCH AS A SLIVER OR TOP

Sadao Ohtake, Nishinomiya; Shuji Hayashida, Osaka; Hirotsugu Matsunaga, Yokkaichi, and Michinobu Kaimori, Suzuka, all of Japan, assignors to Kanebo Limited, Tokyo, Japan

Division of Ser. No. 908,054, May 22, 1978, Pat. No. 4,172,704. This application Dec. 21, 1978, Ser. No. 972,004
Claims priority, application Japan, May 25, 1977, 52-61548
Int. Cl.[2] D06B *23/00*
U.S. Cl. 68—3 R **9 Claims**

1. Apparatus for dyeing a bundle of fibers in a dyeing bath comprising:

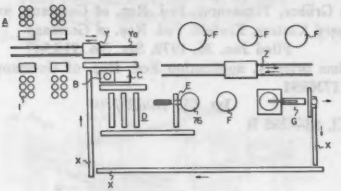
(a) a unit dyeing can formed by a main can and an auxiliary can separably mounted on said main can, filling means for filling a bundle of fibers into an upper portion of said dyeing can wherein said upper portion corresponds to said auxiliary can;

(b) pushing means for pushing a mass of said bundle of fibers contained in said auxiliary can into said main can to form a full packaged main can;

(c) separation means for separating said auxiliary can from said main can;

(d) arrangement means for arranging a plurality of said full packaged main cans in a predetermined positional relationship conforming to the layout of a plurality of main cans in said dyeing bath;

(e) supplying means for supplying said full packaged main cans, which have been previously arranged in said predetermined positional relationship, to said dyeing bath;



(f) dyeing means for dyeing said full packaged main cans; and

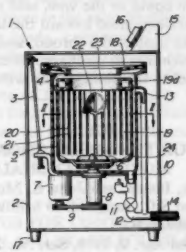
(g) take-out means for taking-out dyed bundles of fibers from said main cans, thereby resulting in an empty main can.

4,202,187

WASHING BASKET OF WASHING MACHINE CAPABLE OF FUNCTIONING AS HYDROEXTRACTOR

Soiti Hukuzawa, Hitachi; Mituyuki Togasi, Iwaki, and Toshiro Mori, Katsuta, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Jun. 6, 1978, Ser. No. 913,058
Claims priority, application Japan, Jun. 9, 1977, 52-67290
Int. Cl.[2] D06F *17/06, 23/04, 37/14*
U.S. Cl. 68—18 F **2 Claims**



1. A washing machine having a hydroextracting function comprising: an outer frame; an outer tub resiliently supported in said outer frame by suspension rod means; a plastic washing basket having a hydroextracting function rotatably supported in said outer tub and provided with a bottom and an upwardly extending side wall; a pulsator provided in said washing basket, substantially at a center of the bottom of said washing basket; driving means provided outside of said outer tub for rotating said pulsator during a washing operation and rotating said washing basket during a hydroextracting operation; means for draining the water from a bottom of said outer tub; means for overflowing the water from an upper portion of a side wall of said outer tub; said side wall of the washing basket having formed on an inner peripheral surface thereof a plurality of longitudinally extending protrusions, each of said protrusions having an arcuate cross-section projecting inwardly of said washing basket, and a plurality of longitudinally extending grooves, each of said grooves being formed between said longitudinally extending projections so that said protrusions and the grooves are alternatively disposed over the entire circumference of the inner peripheral surface of the side wall of said washing basket, wherein hydroextracting apertures are formed at least in bottoms of said grooves, the width of said protrusions being within a range of 20 mm to 50 mm, and the depth of said grooves being within a range of 5 mm to 10 mm,

and said washing basket further being provided with baffle plates at the bottom of said washing basket.

4,202,188

APPARATUS FOR APPLYING A LIQUID ON A MOVING WEB IN PATTERNS

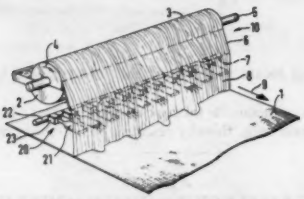
Heinz Grüber, Tönisvorst, Fed. Rep. of Germany, assignor to Eduard Kusters, Krefeld, Fed. Rep. of Germany

Filed Jun. 26, 1978, Ser. No. 918,947

Claims priority, application Fed. Rep. of Germany, Jul. 8, 1977, 2730891

Int. Cl.[2] D06B *1/04*

U.S. Cl. 68—205 R 9 Claims



1. Apparatus for applying a liquid to a moving web in patterns, comprising:

(a) means for forming a liquid shroud which falls on the web and extends transversely over the web; and

(b) means, disposed between said means for forming the liquid shroud and the web, for displacing the falling shroud before it hits the web to cause non-uniform application of the liquid to the web, said means comprising at least one nozzle pointed toward the shroud for blowing a fluid medium against the shroud, said at least one nozzle supported such that its discharge direction is variable, in a plane parallel to the plane of the web.

4,202,189

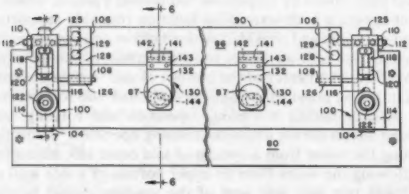
APPARATUS FOR THE APPLICATION OF LIQUIDS TO MOVING MATERIALS

Kenneth J. Addis, Inman, and John K. McCollough, Jr., Spartanburg, both of S.C., assignors to Milliken Research Corporation, Spartanburg, S.C.

Filed Apr. 9, 1979, Ser. No. 28,715

Int. Cl.[2] D06B *1/02*

U.S. Cl. 68—205 R 10 Claims



1. In an apparatus for applying liquids to moving material having means for conveying the material in a pre-determined path of travel, liquid applicator means having a row of outlets positioned above the path of travel of the material for continuously discharging a row of generally parallel streams of liquid downwardly toward the path of travel of the material, fluid discharge means positioned on one side of said row of outlets so that the discharge axes of said fluid discharge means intersect the discharge axes of said outlets, a liquid collection chamber mounted on the other side of said row of outlets, means supplying fluid to said fluid discharge means to direct liquid from said liquid application means into said liquid collection chamber and means mounting a long, thin liquid deflector blade in the path of travel of the liquid deflected by said fluid discharge means to said liquid collection chamber, said means mounting said deflector blade including a means to adjustably position said deflector blade relative to said row of outlets, a second means to apply tension to the end of said deflector blade and a third means to adjust selected portions of the outer edge of said deflector blade relative to other outer portions of said deflector blade.

4,202,190

APPARATUS FOR HIDE STRETCHING

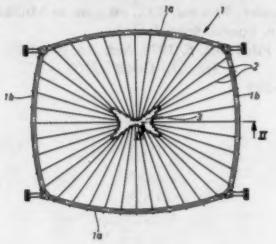
Antti K. Viljanmaa, 34800 Virrat, Finland

Filed Sep. 6, 1978, Ser. No. 939,977

Claims priority, application Finland, Sep. 6, 1977, 772643

Int. Cl.[2] C14B *1/26;* D06C *3/08*

U.S. Cl. 69—19.3 9 Claims



1. In a hide stretching apparatus, in particular for the tentering of wet hides for drying, of the type comprising in combination

a stretching frame having peripherally attached thereto and radially extending inwardly therefrom a plurality of guides, each of said guides having a first end affixed to said frame and a second end affixed to a center piece located centrally in said frame;

a like plurality of clamps, individual ones of said clamps being slidably attached to corresponding ones of said guides so as to be movable in an inward direction and an outward direction, respectively toward said second end and said first end of a corresponding one of said guides, each of said clamps being provided with a pair of jaws operable, by a lever provided each clamp, between an open position and a closed position, said jaws being so disposed and dimensioned as to be capable of grasping an edge of a hide when in said closed position and releasing said edge when in said open position, each of said clamps being further provided with a brake operable between a locked condition, wherein said brake engages with the corresponding one of said guides so as to prevent motion of said clamp along said corresponding one only in said inward direction, and an unlocked condition, wherein said brake is disengaged so as to allow said clamp to travel in both said inward direction and said outward direction; and

a hide changing table provided with a clamp displacement member for each of said clamps, said clamp displacement member being dimensioned and disposed so as to be capable of translating an individual one of said clamps along said corresponding one of said guides in both said inward direction and said outward direction under control of a detachment control and a stretching control;

the improvement comprising

a mechanical linkage between said lever and said brake so configured as to place said brake in said locked condition when said pair of jaws are moved by said lever into said closed position and to place said brake in said unlocked condition when said jaws are moved into said open position;

a first jaw of said pair of jaws being fixed relative to each of said clamps, a second jaw of said pair being attached to said first jaw through a pair of pivoting linkages; and

each said clamp displacement member is provided with a first gripping member which engages an inner edge of said individual one of said clamps to translate said individual one of said clamps in said outward direction, and a second gripping member which releasably engages an outer edge of said individual one of said clamps to impart a motion in said inward direction; said second gripping member being movably controlled relative to said clamp displacement member by said detachment control so as to be capable of engaging said outer edge only on command from said detachment control.

4,202,191

FAULT DETECTOR

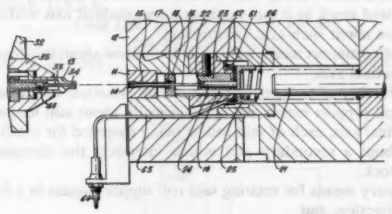
Edward A. Skinner, Welwyn Garden City, England, assignor to Avdel Limited, Hertfordshire, England

Filed Feb. 23, 1978, Ser. No. 880,707

Claims priority, application United Kingdom, Feb. 25, 1977, 8106/77

Int. Cl.[2] B21B *37/00*

U.S. Cl. 72—10 **10 Claims**



1. A fault detector for a metal-forming machine for producing a tubular workpiece which machine is of the type comprising

a fixed die which receives the workpiece;

a movable tool reciprocable in repeated cycles andmovable towards the die to act on the workpiece from the die;

which movable tool includes a metal-forming pin which is first advanced towards the die and into the workpiece, which machine includes means compressing the workpiece around the metal-forming pin so as to form a bore through the tubular workpiece, and which movable tool is subsequently retracted from the die in a direction opposite to the said direction of advance to provide for removal of the workpiece therefrom;

which fault detector comprises:

a detector pin mounted for axial movement along the axis of reciprocation of the said metal-forming pin and normally movable through the bore of the tubular workpiece, after the completion of the compression process, in the direction of retraction of the metal-forming pin; and

fault indicating means responsive to completion or noncompletion of normal movement of the detector pin for producing a signal indicating a fault if the detector pin has not moved normally through the workpiece bore as aforesaid.

4,202,192

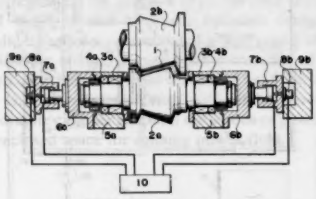
APPARATUS FOR CONTROLLING THE POSITION OF ROLL IN THE DIRECTION OF THE ROLL AXIS

Yoshikazu Haneda; Yoshun Yamamoto; Akira Matsufuji; Takashi Haji, all of Kitakyushu, and Koe Nakajima, Nakama, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Jun. 21, 1978, Ser. No. 917,650

Int. Cl.[2] B21B *37/00, 31/18*

U.S. Cl. 72—21 **6 Claims**



1. An apparatus for controlling the position of at least one roll of a rolling mill in the direction of the roll axis for achieving a desired rolling thrust force in the axial direction, said rolling mill having bearing boxes supporting the roll and a rolling mill housing, said apparatus comprising at least two output means acting on said roll, one for moving the roll in one direction along the roll axis and the other for moving the roll in the opposite direction along the roll axis, output detecting means connected to said output means for detecting the output loads of the respective output means, position detecting means operatively connected with said roll for detecting the position of the roll in the direction of the roll axis, a first arithmetic means connected to said output detecting means for calculating the rolling thrust force in the axial direction of the roll from said detected output loads, a second arithmetic means connected to said first arithmetic means and said position detecting means for receiving inputs therefrom and for calculating the amount of movement of the roll necessary for achieving a desired rolling thrust force in the axial direction and connected to said output means for controlling the output means for moving the roll the desired amount.

4,202,193

APPARATUS FOR CONTROLLING THE CONCENTRATION AND STABILITY OF AN EMULSION

Walter A. Wilson, Pittsburgh, Pa., assignor to National Steel Corporation, Pittsburgh, Pa.

Filed Oct. 3, 1978, Ser. No. 948,626

Int. Cl.[2] B21B *27/10, 45/02*

U.S. Cl. 72—42 **13 Claims**

1. A lubricating system for supplying an oil-in-water emulsion lubricant to a metalworking operation comprising,

a reservoir for containing a supply of emulsion,

means for supplying fresh water to the reservoir,

oil delivery means for supplying oil to the reservoir,

means for mixing oil and water supplied to the reservoir to provide a uniform oil-in-water emulsion,

means for supplying emulsion from the reservoir to a metalworking operation and for returning used emulsion from the metalworking operation to the reservoir, and

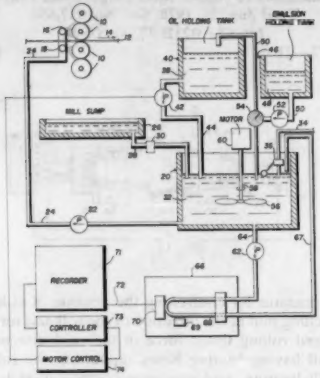
emulsion stability control means for controlling the stability of the emulsion in the system, the stability control means including, in combination,

a liquid density measuring cell operable to continuously measure the density of liquid therein and to generate an electric signal which is a function of the measured density,

circulating means including conduit means connecting the density measuring cell in the lubrication system for circulating a portion of the emulsion through the density measuring cell,

control means connected to said circulating means and operable to periodically interrupt the circulation of emulsion

through the density measuring cell while maintaining emulsion in the density measuring cell for a predetermined time sufficient to permit partial separation of the oil and water phases of the retained emulsion, the control means further including calculator means connected with and



operable to compare the signals from the density measuring cell at the beginning and end of the predetermined time to determine the stability of the emulsion, and

means responsive to the calculator means for dispensing an emulsifying agent for addition to the emulsion to maintain the desired stability.

4,202,194

INCLINED ROLLING STAND

Huibert den Hartog; Klaus Stann, both of Dortmund, and Lutz Stolze, Bonen, all of Fed. Rep. of Germany, assignors to Hoesch Werke Aktiengesellschaft, Dortmund, Fed. Rep. of Germany

Filed Apr. 21, 1978, Ser. No. 898,817

Claims priority, application Fed. Rep. of Germany, Apr. 23, 1977, 2718219

Int. Cl.² B21B *27/02*

U.S. Cl. 72—78 **3 Claims**

1. An inclined rolling stand for reducing a starting material to cylindrical form such as rods and pipes, which comprises in combination: a roll carrier adapted to be driven and to permit a central passage of the material to be rolled, said roll carrier also comprising three conical substantially identical and axially adjustable working rolls which are adapted to be driven and are inclined relative to the rolling axis at the same acute angle, said three working rolls being offset relative to each other around the rolling axis by 120°, each of said conical rolls being angularly displaced relative to an axial plane of said rolling axis through the conical roll so that the axis of said conical roll is at an angle to said axial plane, the smaller end of each conical roll being formed as a concave surface of revolution about the axis of said conical roll and curved in a plane through the axis of said roll to form a concave smoothing zone, said surface curvature conforming to the finished surface of the cylindrical form, so that said starting material is finished by said conical rolls.

4,202,195

SKEW ROLLING MILL ROLLER

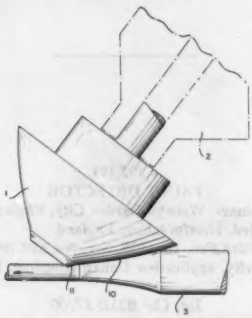
Eckhard Tuschy; Georg Wischmeyer, and Walter Steinkamp, all of Osnabruck, Fed. Rep. of Germany, assignors to Kabel-und Metallwerke Gutehoffnungshuette AG, Fed. Rep. of Germany

Filed Jul. 19, 1978, Ser. No. 926,091

Claims priority, application Fed. Rep. of Germany, Jul. 23, 1977, 2733401

Int. Cl.² B21B *27/02*

U.S. Cl. 72—78 **3 Claims**



1. In a skew rolling mill for cross section reduction of an elongated stock as it moves along a longitudinal axis without rotation about such axis, comprising:

a roller support means mounted for rotation about said longitudinal axis;

a plurality of tapered working rollers mounted within said roll support means and symmetrically about said longitudinal axis, each of said rollers being mounted for rotation about a secondary axis which intersects the elongated stock;

primary means for rotating said roll support means in a first direction; and

first intermediate means for rotating said rollers about said secondary axis and into the surface of said elongated stock for reducing the cross section of said stock,

the improvement comprising said tapered working rollers each including a first surface having the shape of a paraboloid for substantially equal or decreasing deformation in the cross section of the deformation taper of said stock.

4,202,196

METHOD OF MANUFACTURING STATOR CORE

Koichi Asai; Tohsuke Kawada, both of Chiryu; Yoshiyuki Iwaki, and Ryozo Kuroda, both of Himeji, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 10, 1978, Ser. No. 923,400

Int. Cl.² H02K *15/00*; B21D *11/06*

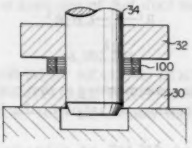
U.S. Cl. 72—137 **8 Claims**

1. A method of manufacturing a stator core, said method comprising:

spirally winding a magnetic strip having on one edge thereof alternate teeth and gaps to form a generally cylindrical spiral core member having a circumferential continuous portion, with said teeth and gaps of each convolution of said spiral core member being aligned axially thereof, with said aligned teeth extending radially inwardly from said circumferential continuous portion to form an inner substantially cylindrical surface defining a circular central

opening, and with said aligned gaps extending radially outwardly from said central opening and said inner substantially cylindrical surface;

forcing a cylindrical tool, having a diameter larger than the diameter of said central opening, into said central opening, and thereby forcing said inner cylindrical surface radially outwardly to enlarge the diameter thereof, while allowing the outer periphery of said spiral core member to freely spread radially outwardly; and



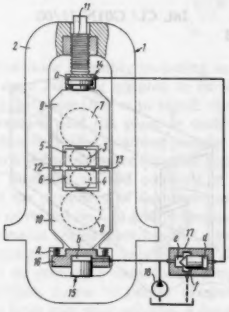
compressing said spiral core member axially thereof, with said cylindrical tool maintained within said central opening, to form a core, and thereby imparting to said circumferential continuous portion a permanent strain sufficient to maintain the inner diameter of said core at a predetermined magnitude after the removal of said cylindrical tool.

4,202,197

DEVICE FOR CONTROLLING THE THICKNESS OF STRIP STOCK BEING ROLLED

Vladimir N. Vydrin; Vladimir G. Dukmasov; Garifulla Davlyatshin, and Sergei L. Kuznetsov, all of Chelyabinsk, U.S.S.R., assignors to Chelyabinsky Politekhnichesky Institut, Chelyabinsk, U.S.S.R.

Filed Dec. 23, 1977, Ser. No. 864,012
Int. Cl.² B21B *37/12*
U.S. Cl. 72—245 **16 Claims**



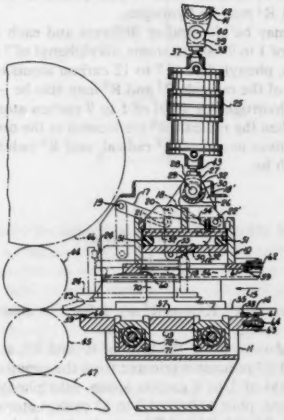
1. A device for controlling thickness of strip stock being rolled between rolls of a roll mill stand including a roll housing on which a screwdown arrangement is mounted, mill rolls with supports accommodated in side recesses of said roll housing for at least a movable roll of the rolls to move in the direction of action of a rolling force, said device consisting of two portions situated on both sides of the roll mill stand and being similarly made, each portion comprising: a hydraulic dynamometer interposed between said supports of one of said work rolls and said roll mill stand housing to absorb the rolling force; at least one hydraulic cylinder provided between said supports of one of said rolls and said roll mill stand housing, a piston-end space of said hydraulic cylinder communicating with a source of power fluid under pressure to build up an adjusting force greater in magnitude than the rolling force, the difference between said forces being large enough for said movable roll and the supports to move in the course of rolling; elastic members to determine the position of said supports of said movable roll and to create a balancing force preventing said supports from being brought together and so positioned as to absorb the difference between the adjusting force and the rolling force, the adjusting force offering resistance to the rolling force and deforming said elastic members of the device, the ratio between a stiffness factor of said elastic members of the device and a stiffness factor of the roll mill stand being predetermined; a valve for regulating the pressure of power fluid effective in a piston-rod space of said hydraulic cylinder, comprising: a casing, a sliding spool accommodated in said casing to define a control chamber communicating with a chamber of said hydraulic dynamometer to form an enclosed fluid-filled space and a throttle chamber communicating with said piston-rod space of said hydraulic cylinder and with the source of power fluid to form an enclosed space for running power fluid.

4,202,198

STRIP MILL ENTRY GUIDES AND METHOD OF CLAMPING WORKPIECE THEREIN

Andrew J. Petros, Oakdale, Pa., assignor to Mesta Machine Company, Pittsburgh, Pa.

Filed Oct. 30, 1978, Ser. No. 956,176
Int. Cl.² B21B *37/16*
U.S. Cl. 72—250 **17 Claims**



1. A mill entry guide mechanism including a support frame with upper and lower platens positioned to receive an elongated workpiece therebetween and drive means movably supporting one of said platens from said frame for driven movement toward said other platen to clamp a workpiece therebetween, the improvement comprising second drive means disposed between said first drive means and said one platen to further drive said one platen into heavier clamping engagement with the workpiece after clamping engagement has been effected by said first drive means, and lock means extending between said second drive means and said frame and engageable to block said first drive means against forced retraction by said second drive means.

4,202,199

MANUFACTURE OF ALKYLPHENOL COMPOUNDS

Franz Merger, Frankenthal, and Gerhard Nestler, Ludwigshafen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

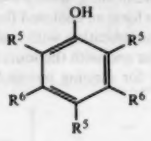
Filed Oct. 6, 1977, Ser. No. 839,775

Claims priority, application Fed. Rep. of Germany, Nov. 6, 1976, 2650888

Int. Cl.[2] **C07C** *37/14*

U.S. Cl. 568—793 **11 Claims**

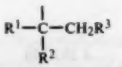
1. A process for the continuous manufacture of alkylphenol compounds of the formula



I,

where R^5 and R^6 are defined as follows:

(A) at least one R^5 is



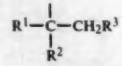
and one or two R^5 may also be hydrogen, alkyl of 1 to 9 carbon atoms, alkylphenyl of 7 to 12 carbon atoms, phenylalkyl of 7 to 12 carbon atoms or phenyl,

(i) R^1, R^2 and R^3 are identical or different and each is alkyl of 1 to 9 carbon atoms with the proviso that R^1 may also be alkylphenyl of 7 to 12 carbon atoms, phenylalkyl of 7 to 12 carbon atoms or phenyl and at least one of R^2 and R^3 may be hydrogen,

(B) R^6 may be identical or different and each is hydrogen, alkyl of 1 to 9 carbon atoms, alkylphenyl of 7 to 12 carbon atoms, phenylalkyl of 7 to 12 carbon atoms or phenyl, or

(C) one of the radicals R^5 and R^6 may also be $—OR^4$ where R^4 is hydrogen or alkyl of 1 to 9 carbon atoms,

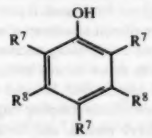
(ii) when the radicals R^6 are located in the ortho- or para-position to an $—OR^4$ radical, said R^6 radicals may also each be



wherein R^1, R^2 and R^3 are defined as described in part (A) above,

with the proviso that in the total of R^5 and R^6, at least one of said R^5 and R^6 radicals is selected from the group consisting of $—OR^4$, alkyl of 1 to 9 carbon atoms, alkylphenyl of 7 to 12 carbon atoms, phenylalkyl of 7 to 12 carbon atoms or phenyl, and R^1, R^2, R^3, R^4, R^5 and R^6 may also be substituted by alkyl of 1 to 3 carbon atoms, which comprises:

continuously reacting phenolic compounds of the formula

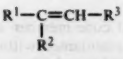


III

where the radicals R^7 and R^8 are each hydrogen when the corresponding radicals R^5 and R^6 in formula I are

and when the radicals R^5 and R^6 have meanings other than

then R^7 has the same meaning as that particular R^5 and R^8 has the same meaning as that particular R^6, with olefins of the formula



II,

where R^1, R^2 and R^3 are defined as in part (A) above, at temperatures of from 70° to 140° C. in the presence of an organic cation exchanger as a catalyst having a gel-like structure and possessing sulfonic acid groups, said exchanger having a particle size of from 10 to 200 micrometers and being suspended in the liquid reaction mixture.

4,202,200

APPARATUS FOR DETECTING EXPLOSIVE SUBSTANCES

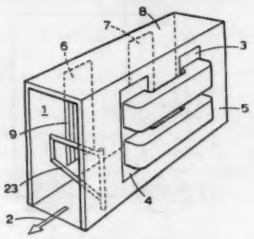
Allan H. Ellson, Harpenden, England, assignor to Pye (Electronic Products) Limited, Cambridge, England

Continuation of Ser. No. 810,665, Jun. 28, 1977, abandoned. This application Oct. 16, 1978, Ser. No. 951,557

Claims priority, application United Kingdom, Jul. 1, 1976, 27447/76

Int. Cl.[2] **G01N** *31/00*

U.S. Cl. 73—23 **8 Claims**



1. An apparatus for detecting the presence of explosives by screening subjects passing through a controlled access tunnel, comprising:

(a) a substantially open ended tunnel having a cross-section so that subjects can proceed in a single file through the tunnel, said tunnel comprising side walls and an entrance;

(b) a first pair of apertures, one of each of said apertures of said first pair being located in each respective said side wall of the tunnel, located at a first distance from said entrance to the tunnel;

(c) a second pair of apertures, one of each of said apertures of said second pair being located in each respective said side wall of the tunnel and located at a second distance greater than the first distance from the entrance to the tunnel;

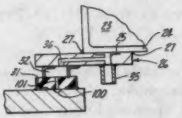
(d) first air duct means extending between a first aperture of said first pair and a first aperture of said second pair;
(e) second air duct means extending between a second aperture of said first pair and second aperture of said second pair;
(f) means for inducing a circulatory flow of air through said first air duct means, across the tunnel between the apertures of said first pair, through said second air duct means and across the tunnel between the apertures of said second pair; and
(g) means for detecting the vapor of an explosive substance in the air in at least one of said duct means.

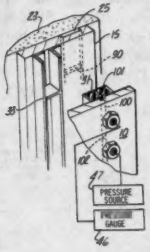
4,202,201

ISOLATION AND DUST SEALING DOOR ASSEMBLIES WITH INTEGRAL TESTING MEANS

Andrew P. Johnson, 1620 Kensington Rd., Bloomfield Hills, Mich. 48013

Continuation-in-part of Ser. No. 711,219, Aug. 3, 1976, Pat. No. 4,114,424. This application Apr. 27, 1978, Ser. No. 900,564
Int. Cl.[2] G01M *3/32*
U.S. Cl. 73—40 **26 Claims**





1. An isolation door assembly including in combination a door frame, a door coaming adapted to be attached to said door frame in a flat plane, means to attach said door coaming to said door frame in said flat plane in such a manner as to provide a continuous sealed coaming annulus there between, closeable means to admit pressure into said coaming annulus, a door hingedly mounted to said coaming, a sealing surface mounted about the periphery of said door, a complimentary sealing surface provided on said door coaming and adapted to provide a continuous sealed door annulus, closeable means to admit a test pressure into said door annulus, a sealing annulus means adapted to provide a continuous annulus underneath said sealing surface, means to permit pressure to enter said sealing annulus from said door annulus, a door locking assembly operatively mounted to said door having at least one shaft penetrating said door, means to seal said shaft, and means to test said shaft seal.

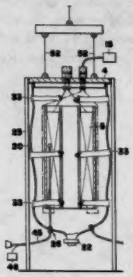
4,202,202

METHOD AND APPARATUS FOR DETECTING DEFLECT IN LIQUID METAL HANDLING INSTRUMENTS

Hideji Yagisawa, Mito, Japan, assignor to Doryokuro Kakunenryo Kaihatsu Jigyodan, Tokyo, Japan

Filed Dec. 29, 1978, Ser. No. 974,518
Claims priority, application Japan, Jan. 12, 1978, 53-1542
Int. Cl.[2] G01M *3/04*
U.S. Cl. 73—40 **8 Claims**

1. A method of detecting defects in a liquid metal handling instrument wherein said instrument has a conduit structure invisible from the outside of said instrument, comprising the steps of: disposing said conduit structure in a cylindrical vessel filled with an inert gas; sealing said vessel; filling said conduit structure with a liquid inactive to said liquid metal to thereby



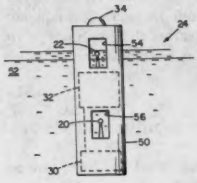
permit said liquid to leak out of a defective spot of said conduit structure; and inserting a fiber scope into said vessel to thereby detect said defective spot of said conduit structure from which said liquid leaks.

4,202,203

OSCILLATOR DETECTOR

Bronson M. Potter, R.F.D. 1, Mason, N.H. 03048

Continuation-in-part of Ser. No. 827,130, Aug. 24, 1977, abandoned. This application Dec. 26, 1978, Ser. No. 972,651
Int. Cl.[2] G01N *27/18*
U.S. Cl. 73—61.1 R **14 Claims**



1. A detector for detecting an alien immiscible liquid in the presence of a desired liquid, e.g., for detecting oil pollution at a surface boundary of water, comprising a monitoring element exposed for heat transfer contact with said alien liquid when present, said monitoring element having an electrical characteristic that changes as a single-valued function of temperature, said monitoring element connected in and energized by an oscillatory electronic circuit, said oscillatory electronic circuit being arranged to heat said monitoring element to a temperature substantially above ambient temperature, the amount of heat conducted away from said monitoring element and thereby the instant level of temperature of the monitoring element above the temperature of the liquid being dependent upon the thermal absorptive properties of said liquid, the oscillation waveform of said oscillatory circuit being dependent upon the temperature-dependent electrical characteristic of said monitoring element, means to derive an output signal from said circuit dependent upon said waveform and indicating the thermal loss of said monitoring element to said surrounding liquid, and an alien liquid indicator circuit responsive to a predetermined change in said oscillation waveform for indicating the presence of said alien liquid, said predetermined change related to the difference in the specific heats of the alien and the desired liquids.

4,202,204
APPARATUS AND METHOD FOR MEASURING CHANGES IN CONDITIONS IN COAGULATING LIQUIDS

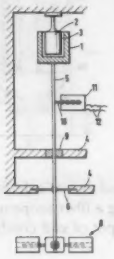
Hellmut Hartert, Kaiserslautern, Fed. Rep. of Germany, assignor to Dr. E. Fresenius Chem.-Pharm. Industrie KG, Oberursel, Fed. Rep. of Germany

Filed Sep. 12, 1978, Ser. No. 941,587

Claims priority, application Fed. Rep. of Germany, Sep. 13, 1977, 2741060

Int. Cl.[2] G01N *11/10, 33/16*

U.S. Cl. 73—64.1 **11 Claims**



1. Method of measuring the changes of state in solidifying fluids particularly the changes occurring in the coagulation of blood, comprising the steps of mounting a measuring vessel containing an annular space on the upper end of an upright support in a measuring system, introducing a fluid into the annular space in the measuring vessel, impressing an excitation frequency on the support and providing the support with a forced oscillatory orbital movement in the resonance range of and different from the natural frequency of the measuring system, and measuring the amplitude of the support for determining the change in state of the solidifying fluid.

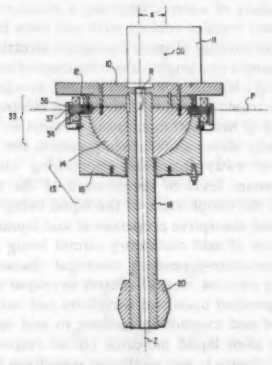
4,202,205
INTEGRAL TORQUER FOR MASS MEASUREMENT SYSTEM

David A. Carpenter, Parkton, Md., assignor to MRC Corporation, Hunt Valley, Md.

Filed May 26, 1978, Ser. No. 909,638

Int. Cl.[2] G01M *1/16*

U.S. Cl. 73—65 **10 Claims**



1. A mass properties measurement system, comprising:

a substantially planar test object support table;

bearing means for supporting said table for rotation about an axis of rotation substantially perpendicular to the plane of the support table;

means mounting said bearing means and support table to a static support to permit movement of said bearing means and support table about a pivot axis substantially perpendicular to and intersecting said axis of rotation;

means for measuring overturning forces imparted to the support table and bearing means by a test object mounted to the support table, said overturning forces tending to rotate the table and bearing means about said pivot axis; and

drive means for inducing rotational forces to said support table and bearing means to rotate said support table and bearing means at a predetermined rate of rotation while remaining substantially invisible to said measuring means, said drive means comprising an induction motor mounted to the mass properties measurement system and having substantially ring-shaped stator and rotor windings coupled to said static support and table, respectively, said windings lying in a plane which contains said pivot axis and is substantially perpendicular to said axis of rotation.

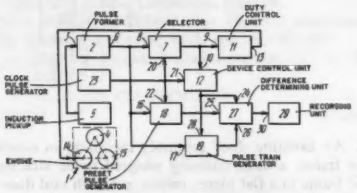
4,202,206
DEVICE FOR MEASURING POWER OUTPUT OF AN INTERNAL-COMBUSTION ENGINE

Ivan D. Bukhtiyarov; Viktor B. An; Alexei S. Demin, all of Novosibirskaya; Marat N. Farshatov, Tolyatti Kuibyshevskoi, and Valery A. Slepchuk, Novosibirsk, all of U.S.S.R., assignors to Spetsialnoe Opytnoe Proektno-Konstruktorsko-Tekhnologicheskoe Bjuro Sibirskogo Otdelenia Vsesojuznoi Akademii Selskokhozyaistvennykh Nauk Imeni v.i. Lenina, Novosibirskaya, U.S.S.R.

Filed Oct. 6, 1978, Ser. No. 949,097

Int. Cl.[2] G01M *15/00*

U.S. Cl. 73—116 **8 Claims**



1. A device for measuring the power output of an internal-combustion engine, having an alternating-current generator with an output, an ignition system having an input and an output and coupled mechanically with said alternating-current generator, a shaft mechanically coupled with said alternating-current generator, and an ignition system which device comprises:

a pickup for taking up the speed of rotation of the shaft of said internal-combustion engine, having an output;

a pulse former having an input and an output, said input being connected to said output of said pickup taking up the speed of rotation of said shaft of said internal-combustion engine;

a selector for selecting the speed of said shaft of said internal-combustion engine, having a first input, a second input, and an output, said first input being coupled to said output of said pulse former;

a unit for controlling the duty of said internal-combustion engine having an input and an output, said input being coupled to said output of said selector, and said output being coupled to the input of said ingnition system;

a unit for controlling said device, having a first input, a second input, and an output, said first input being coupled to said output of the selector;

a unit for producing a preset number of electric pulses, having a first input, a second input, and an output, said

first input being coupled to said output of said pulse former;

a clock pulse generator having an output connected to said second input of said selector, to said second input of said device control unit and to said second input of said unit for producing a preset number of electric pulses;

a unit for producing a train of electric pulses the number of which within each said train being proportional to the portions of the periods of the pulses generated by said pulse former, said portions lying within the time intervals defined by said device control unit, having a first input, a second input and an output, said first input being coupled to said output of said pulse former, and said second input being coupled to said output of said device control unit;

a unit for determining the difference of two adjacent pulse trains, having a first input, a second input, a third input and an output, said first input being coupled to said output of said device control unit, said second input being coupled to said output of said unit for producing a preset number of electric pulses and said third input being coupled to said output of said unit producing a train of electric pulses;

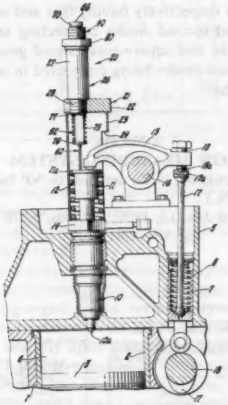
a measurement result recording unit having a first input, said first input being coupled to said output of said unit for determining the difference of two adjacent pulse trains.

4,202,207

UNIT INJECTOR TIMING GAGE

Gary W. Johnson, Bloomfield Hills, and Carl J. Robinson, Pontiac, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jan. 24, 1979, Ser. No. 5,952
Int. Cl.[2] G01M *15/00*
U.S. Cl. 73—119 A **3 Claims**



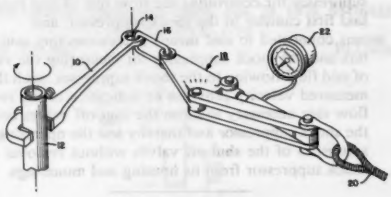
1. A timing gage for use in setting the height and therefore the timing of the follower, reciprocally journaled in the housing of a unit injector that is mounted in an engine whereby a rocker arm in the drive train therefor can actuate the follower, the timing gage including an electrically conductive gage base including a base with an aperture therethrough and a slotted sleeve depending therefrom which is adapted to loosely encircle the follower and have its free end abut against a fixed element of the engine; an electrically conductive contact base of hollow tubular configuration fixed at one end to said base; an electrically insulating sleeve means slidably positioned in said contact base; an electrically conductive battery holder means slidably positioned in said contact base and normally electrically insulated therefrom by said sleeve means, said battery holder means being adapted to receive an electrical battery and having one end thereof provided with a light socket means; a light bulb operatively positioned in said light socket means with a terminal end thereof adapted to engage a terminal of the battery; an electrical contact pin fixed to the opposite end of said battery holder means so as to have one end thereof extending axially downward therefrom through said aperture into said slotted sleeve for engagement with the follower of the unit injector, the opposite end of said contact pin being adapted to engage the other terminal of the battery, said battery holder means having an annular radially outward extending, axially adjustable flange means adjacent said one end thereof adapted to be in an abutting interference relation with the opposite end of said contact base upon axial movement of said battery holder means relative to said contact base whereby when said flange means abuts against said contact base an electrical circuit is completed from one terminal of the battery via said contact pin, the unit injector housing, said sleeve member, said gage base, said battery holder means, said light bulb to the opposite terminal of the battery, and a spring means electrically insulated from but operatively associated with said battery holder means and said gage base to normally bias said battery holder means in one axial direction relative to said contact base to normally move said flange toward abutment against said contact base.

4,202,208

HYDRAULIC TORQUE INDICATOR

Joseph H. Byrne, Jr., Houston, Tex., assignor to Joy Manufacturing Company, Pittsburgh, Pa.

Filed Oct. 23, 1978, Ser. No. 953,736
Int. Cl.[2] B25B *23/14*
U.S. Cl. 73—139 **14 Claims**

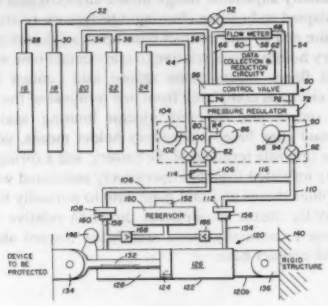


1. A torque indicator comprising a support member, a link arm having one end pivotally connected to said support member about a first pivot axis, fluid cylinder means having one end pivotally connected to said member about a second pivot axis which is parallel to but spaced from said first pivot axis, the other end of the fluid cylinder means being pivotally connected to said link arm intermediate its ends about a third pivot axis which is parallel to the first and second pivot axes, means for causing a pulling force equal to the force on a torque arm to exist between a point on said member and a point on the other end of said link opposite said first pivot axis, said point on the member being spaced from said first and second pivot axes so as to form a triangular configuration therewith, fluid interposed between a reciprocable piston in said cylinder means and an end of a cylinder in which it reciprocates such that the fluid will be pressurized when said pulling force exists between the point on the support member and the point on the other end of said link, means for varying the volume of said fluid to thereby vary the angular relationship between said fluid cylinder means and said link arm, and pressure-responsive means adapted for connection to the end of the cylinder containing said fluid.

4,202,209
SHOCK SUPPRESSOR VALVE TEST SYSTEM AND METHOD

Lloyd H. Holmes, Salt Lake City, Utah, assignor to E-Systems, Inc., Dallas, Tex.

Filed May 26, 1978, Ser. No. 910,009
Int. Cl.[2] G01M *19/00*
U.S. Cl. 73—168 21 Claims



1. A portable test system for testing the operating characteristics of the flow responsive shut-off valves interconnecting fluid cavities of a shock suppressor mounted in place, comprising:

a first canister for housing a fluid under pressure, said fluid being forced through the shut-off valves of the shock suppressor during testing;

a second canister for collecting said fluid after passage through the shut-off valves of the shock suppressor;

means for releasably interconnecting said first and second canisters with the fluid cavities of the shock suppressor;

first manual valve means disposed within said means interconnecting said first and second canisters and the shock suppressor for controlling the flow rate of said fluid from said first canister to the shock suppressor; and

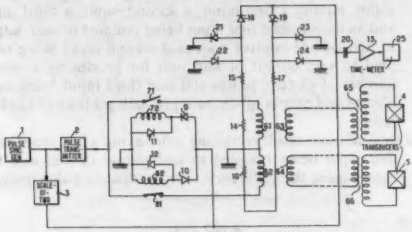
means connected to said means interconnecting said canisters and the shock suppressor for measuring the velocity of said fluid flowing to the shock suppressor, such that the measured velocity provides an indication of the required flow rate necessary to close the shut-off valves and lock the shock suppressor and thereby test the operating characteristics of the shut-off valves without removal of the shock suppressor from its housing and mountings.

4,202,210
ULTRASONIC FLOW METER FOR GASES

François Multon, Les Mureaux, and Gerard Allain, Andresy, both of France, assignors to Ultraflux, France

Filed Apr. 5, 1978, Ser. No. 893,738
Claims priority, application France, Jan. 6, 1978, 78 00845
Int. Cl.[2] G01F *1/66*
U.S. Cl. 73—194 A 2 Claims

1. An apparatus for measuring fluid flow in a passage, said apparatus comprising: first and second transducers respectively having first and second transmitting-receiving surface portions, coupled to the passage, said first and second surface portions being parallel and facing one another; pulse generator means generating recurrent pulses at a predetermined repetition frequency; an electric pulse transmitter coupled to said pulse generator means; square-wave signal generator means, coupled to said pulse generator means, for generating a square-wave signal having a frequency equal to half the said repetition frequency, said square-wave signal alternately having positive and negative half-periods; first switching means, controlled by the said square-wave signal, for coupling the said pulse transmitter to the first transducer during the said positive half-periods and to the second transducer during the said negative half-periods, whereby a first acoustic pulse is propagated across the fluid passage from the first transducer to the second transducer during each of said positive half-periods and a first electric pulse is generated at a first time when the said first acoustic pulse reaches the second transducer, while a second acoustic pulse is propagated across the fluid passage from the second transducer to the first transducer during each of said negative half-periods and a second electric pulse is generated at a second time when the said second acoustic pulse reaches the first transducer, the apparatus further comprising: electric pulse receiver means having an input and an output; further switching means, controlled by the said square-wave signal,

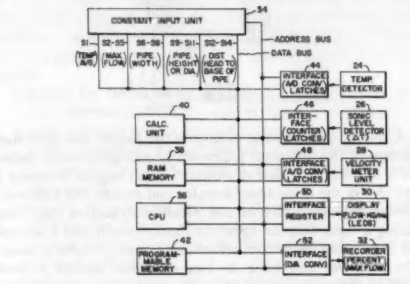


for coupling the second transducer to the input of the pulse receiver means during the positive half-periods and for coupling the first transducer to the input of the pulse receiver means during the negative half-periods; and means, connected to the output of the pulse receiver means, for measuring the time interval between the first and second times, wherein said first switching means comprise first and second electromagnetic relay means respectively having first and second control coils and first and second diodes connecting said respective control coils to the said square-wave signal generator means, said first and second diodes being connected in opposite directions to one another.

4,202,211
FLOW MEASURING SYSTEM

Jack A. Perry, Lewiston, N.Y., assignor to NP Industries, Inc., Niagara Falls, N.Y.

Filed Jan. 12, 1979, Ser. No. 3,074
Int. Cl.[2] G01F *1/00*
U.S. Cl. 73—227 5 Claims



1. A system for measuring the volume of fluid flowing through a pipe without interfering with the flow of said fluid through said pipe, which system comprises

(a) means providing a first free space above said pipe which communicates with the interior thereof,

(b) means providing a second space at the bottom of said pipe which communicates with the interior thereof,

(c) said second space being separated from the interior of said pipe,

(d) means including an ultrasonic distance detector disposed in said first space out of contact with said pipe and the fluid therein,

(e) means including an ultrasonic velocity detector disposed in said second space out of contact with said pipe and said fluid therein,

(f) means for providing signals representing the cross sectional profile of said pipe, and

(g) means for providing measurement of the flow through said pipe operated by said signals, said distance detector and said velocity detector.

4,202,212

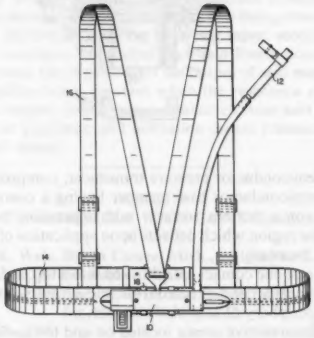
IN-LINE RESPIRATING PUMP

Richard T. Allen, Easton, Md.; Rudolph H. Moyer, West Covina, Calif.; Donald J. Sibbett, Cucamonga, Calif.; Howard H. Anderson, Covina, Calif.; Glen R. Martner, Rosemead, Calif., and Don Willis, Garden Grove, Calif., assignors to Geomet, Incorporated, Gaithersburg, Md.

Filed May 1, 1978, Ser. No. 901,862

Int. Cl.[2] G01N *1/14*

U.S. Cl. 73—421.5 R **8 Claims**



1. An in-line respirating pump adapted for support upon the thoracic cavity and comprising:

(A) An expandable belt including a cable adapted to encircle the thoracic cavity;

(B) A housing supported horizontally upon said belt, so as to define a horizontal piston chamber and;

i. a spring-urged piston reciprocally supported in said chamber and connected at one end to said cable, so as to move laterally upon thoracic expansion; and

ii. an air inlet valve and an air outlet valve defined in said chamber at one end of said piston, each valve being normally biased closed, said inlet valve being openable as said piston moves upon thoracic expansion and said outlet valve being openable, as said piston is returned to closed position as upon exhalation; and

(C) An air pollution sampler attached to said inlet valve.

4,202,213

DEVICE FOR AUTOMATICALLY LOCKING MOTOR VEHICLE WHEELS ON TO BALANCING MACHINES

Franco Toriselli, Reggio Emilia, Italy, assignor to S.I.C.E. Societa Italiana Costruzioni Elettromeccaniche S.p.A., Correggio, Italy

Filed Mar. 22, 1978, Ser. No. 888,869

Claims priority, application Italy, Mar. 29, 1977, 46841 A/77

Int. Cl.[2] G01M *1/06*

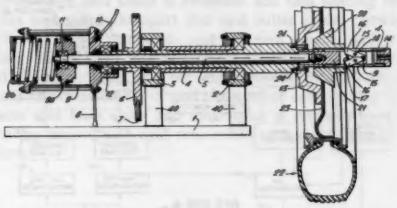
U.S. Cl. 73—487 **4 Claims**

1. A device for automatically locking motor vehicles wheels on to the projecting end of a high speed rotating support shaft, which comprises:

(a) an axially hollow support shaft,

(b) a traction shaft therein inserted, which rotates rigidly with said support shaft,

(c) a stationary cylinder-piston unit at one end of said hollow support shaft, the piston of which is connected to one end of the traction shaft by bearing means mounting the shaft for rotation relative to the piston,



(d) the other end of the said traction shaft which projects from the support shaft comprising means for locking a wheel on said support shaft and comprising at least one pair of teeth or pawls which oscillate mutually and are symmetrically disposed about the longitudinal axis of the traction shaft, and which are disposed between and pivoted on the arms of a fork fixed to the free end of the traction shaft; between the facing edges of the engaging ends of said at least two pawls there being disposed a compression spring lying in front of the crosspiece of said fork.

4,202,214

WHEEL FIXING DEVICE FOR A WHEEL BALANCER

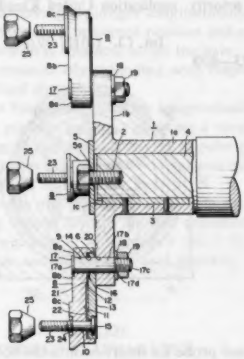
Yukiyoshi Hihara, Fujinomiya, Japan, assignor to Yasui Sangyo Co. Ltd., Fujinomiya, Japan

Filed Sep. 11, 1978, Ser. No. 940,896

Claims priority, application Japan, Jun. 23, 1978, 53-76132

Int. Cl.[2] G01M *1/16*

U.S. Cl. 73—487 **10 Claims**



1. A wheel fixing device for a wheel balancer, comprising:

(a) a flange attached to the end of the main axle of the balancer, in which are a plurality of holes;

(b) a plurality of fixing arms of equal length, whose base ends are adapted to be pivotally coupled to said holes in said flange, and whose free ends are provided with means for attaching a vehicle wheel; and

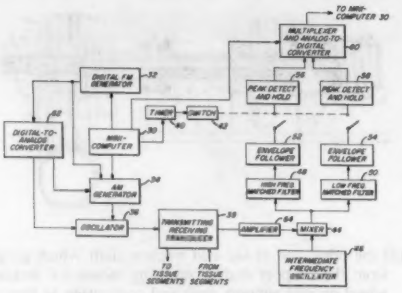
(c) locking means for locking each of said fixing arms and its pivotal coupling to said flange upon the attachment of a wheel by said attaching means.

4,202,215

SONIC PULSE-ECHO METHOD AND APPARATUS FOR DETERMINING ATTENUATION COEFFICIENTS

Charles R. Meyer, Pittsburgh, Pa., assignor to Kurt Orban Company, Inc., Wayne, N.J.

Filed Oct. 26, 1978, Ser. No. 954,767
Int. Cl.[2] G01N *29/00*
U.S. Cl. 73—599 **44 Claims**



1. A method for determining the attenuation coefficient of a tissue segment comprising the steps of:

a. transmitting into said tissue segment a first ultrasonic pressure pulse such that the echo returning from a first boundary within said tissue segment is white;

b. transmitting into said tissue segment a second ultrasonic pressure pulse such that the echo returning from a second boundary within said tissue segment is white;

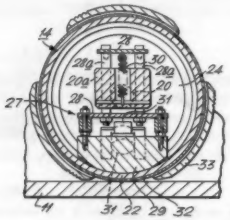
c. determining the attenuation coefficient of said tissue segment as a function of said transmitted pulses and the thickness of said tissue segment.

4,202,216

ULTRASONIC TESTING

Reginald B. Bull, Thatcham; Colin Duffill, Abingdon, and Ronald A. Usmar, Didcot, all of England, assignors to British Gas Corporation, London, England

Filed Aug. 11, 1978, Ser. No. 933,032
Claims priority, application United Kingdom, Aug. 23, 1977, 35354/77
Int. Cl.[2] G01N *29/04*
U.S. Cl. 73—639 **10 Claims**



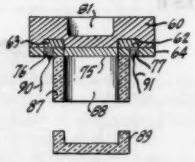
1. A wheel probe for insertion into the bore of a pipe for the purpose of ultrasonically inspecting the wall of the pipe, the wheel probe comprising a main wheel assembly comprising a solid annular rim made of a material through which sound will pass, and side members which together with the rim define a hollow chamber, at least one ultrasonic transducer located within the chamber and positioned therein for directing and receiving sound through the rim, first and second mounting members, the main wheel assembly being mounted for rotation about its central axis in the first mounting member which is itself mounted in the second mounting member for pivotal movement about a first axis which extends in a direction normal to the central axis of the main wheel assembly, and a guide wheel located on each side of the main wheel assembly, the guide wheels being movable bodily independently of the main wheel assembly and being mounted on the first mounting member for pivotal movement in unison about a second axis which is parallel to the central axis of the main wheel assembly, and being operable when one or both of the guide wheels is deflected to move the first mounting member and hence the main wheel assembly about said first axis which extends in a direction normal to the central axis of the main wheel assembly.

4,202,217

SEMICONDUCTOR TRANSDUCERS EMPLOYING FLAT BONDABLE SURFACES WITH BURIED CONTACT AREAS

Anthony D. Kurtz, Englewood, and Joseph R. Mallon, Franklin Lakes, both of N.J., assignors to Kulite Semiconductor Products, Inc., Ridgefield, N.J.

Filed Dec. 12, 1977, Ser. No. 859,834
Int. Cl.[2] G01L *9/06*
U.S. Cl. 73—727 **13 Claims**



1. A semiconductor pressure transducer, comprising:

(a) a semiconductor base member having a central depression on a bottom surface, said depression defining an active region which deflects upon application of a force to said member,

(b) at least one contact area diffused into a top surface of said base member and directed from said active region towards the periphery of said base member,

(c) a piezoresistive sensor located on said top surface of said base member and in contact with said contact area within said active region,

(d) an epitaxial semiconductor layer located on and extending from said top surface of said base member and surrounding said active region, said layer having at least one terminal aperture on a surface thereof in communication with said contact area closest to said periphery of said base member, and

(e) an annular housing, said housing having sidewalls of a predetermined thickness with the inner periphery of said sidewalls forming a central aperture relatively congruent to said central depression, said housing coupled to said epitaxial layer with the inner periphery of said sidewalls surrounding said central depression and with the outer periphery of said sidewalls adjacent said terminal aperture in said epitaxial layer to therefore completely mechanically isolate said terminal aperture from said active region by said thickness of said sidewalls.

4,202,218

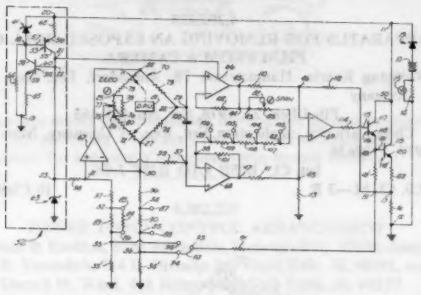
BRIDGE CIRCUIT

Edgar A. Romo, Costa Mesa, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 837,452, Sep. 28, 1977, abandoned. This application Jun. 28, 1978, Ser. No. 919,966
Int. Cl.[2] G01B *7/18*; G01L *9/04*
U.S. Cl. 73—766 **18 Claims**

1. A detector circuit comprising: a Wheatstone bridge having first, second, third and fourth corner junctions; a first leg

connected between said fourth and first corner junctions; a second leg connected between said first and second corner junctions; a third leg connected between said second and third corner junctions; a fourth leg connected between said third and fourth corner junctions; a main differential amplifier having inverting and noninverting inputs, and an output; first means to supply a voltage to said main differential amplifier noninverting input regulated with respect to ground, said main



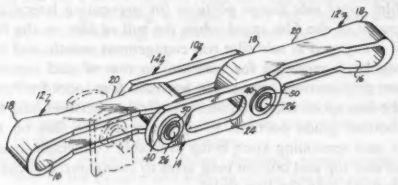
differential amplifier output being connected to said second corner junction, said fourth corner junction being connected to said main differential amplifier inverting input; second means providing resistance connected from said fourth corner junction to ground, the current from the output of said main differential amplifier being constant when the resistance of any of said legs changes; output means connected from said first and third corner junctions; and utilization means connected from said output means.

4,202,219

CHAIN PIN ASSEMBLY WITH CAPTIVE SECURING MEANS

Siegfried K. Weis, Byron Center, Mich., assignor to C. L. Frost & Son, Inc., Grand Rapids, Mich.

Filed Apr. 18, 1978, Ser. No. 897,401
Int. Cl.[2] G01F *3/08, 3/14*
U.S. Cl. 74—254 **25 Claims**



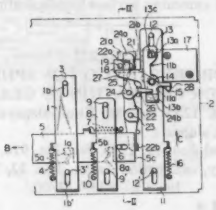
1. A chain assembly comprising at least one center link having a pivot pin receiving aperture therethrough adjacent each end, at least one pair of side links, said side links having apertures therethrough at each end and received one on each side of said center link with the corresponding ends of said side links overlapping one end of said center link such that said respective apertures are aligned; spacing means at each end of said center link and said side links for spacing said side links outwardly along a pivot pin; a pivot pin extending through said aligned apertures to allow pivotal movement of said side links with respect to said center link; said pivot pin including a pin body having a width, a length greater than the combined thickness of said side links, said center link and said spacing means, and first and second retaining means at spaced positions on said pin body for retaining said chain links therebetween; at least one of said retaining means including a collar having a width greater than said pin body and an aperture therethrough, one end of said pin body being slidably telescoped through said collar aperture; said one retaining means also including removable securing means secured to and extending outwardly from said pin body between said collar and said one end of said pin body and having an outside dimension; said collar including a recess in its surface adjacent said removable securing means, said recess being only slightly larger than said outside dimension of said securing means such that said collar is slidable over said removable securing means to receive said securing means therein when said chain is extended and said spacing means forces said side links apart and said collar is slid outwardly such that said collar abuts said securing means, said recess fitting closely over said removable securing means whereby said collar protects and prevents removal of said securing means and disassembly of said chain while said spacing means spaces said links apart and said collar is retained over said securing means with said removable securing means in said recess.

4,202,220

SOLENOID ACTUATED CONTROL SYSTEM

Sigeru Matsumoto, Yokohama, Japan, assignor to Victor Company of Japan, Limited, Yokohama, Japan

Filed Apr. 3, 1978, Ser. No. 893,245
Claims priority, application Japan, Apr. 4, 1977, 52/41958[U]
Int. Cl.[2] G05G *9/02, 1/02*
U.S. Cl. 74—471 R **2 Claims**



1. A solenoid actuated control system comprising:
a plurality of instruments;
a solenoid device having a plunger longitudinally movable along an axis between a projected position and a retracted position and which is rotatable about the axis;
an actuator pin transversely extending with respect to said plunger and fixed thereto;
urging means for biasing said plunger longitudinally toward the projected position and also applying a torque to said plunger to bias it to a predetermined angular position in which said actuator pin is in operative alignment with one of said plurality of instruments; and
means for angularily moving said plunger, against the action of said urging means, toward another predetermined angular position in which said actuator pin is in operative alignment with another one of said plurality of instruments.

4,202,221

INDEXING APPARATUS

Daniel T. Thompson, Pacific Palisades, Calif., assignor to Thompson Bagel Machine Manufacturing Corp., Los Angeles, Calif.

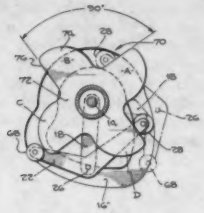
Filed Oct. 6, 1978, Ser. No. 949,042
Int. Cl.[2] B23Q *17/00*
U.S. Cl. 74—821 **12 Claims**

1. Indexing apparatus driven by a rotating drive shaft comprising:
(a) a guide member having a camming surface disposed about the drive shaft;
(b) a rotated member mounted for rotation about an axis

passing longitudinally through the drive shaft, said rotated member being the output of the indexing apparatus and being adapted to operably connect to and drive apparatus driven thereby;

(c) a driving arm connected on one end to the drive shaft and extending radially therefrom for rotation therewith; and,

(d) an engaging arm rotatably connected to the other end of said driving arm for rotation between an engaged position



and a retracted position, said engaging arm having means for engaging and rotating said rotated member when said engaging arm is in said engaged position and for releasing said rotated member when said engaging arm is in said retracted position, said engaging arm further having cam follower means for engaging said camming surface to rotate said engaging arm between said positions as a function of said camming surface configuration.

4,202,222

METHOD FOR PREPARATION OF SPHERICAL HOB FOR GENERATION OF GEAR

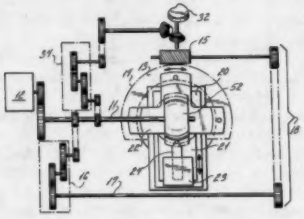
Masato Ainoura, 1253 Eguchi, Kita-Shiegeyasu-cho, Miyaki-gun, Saga-ken, Japan

Filed Jun. 19, 1978, Ser. No. 916,690

Claims priority, application Japan, Jun. 22, 1977, 52/74142

Int. Cl.[2] B23F *17/00*

U.S. Cl. 76—101 A **4 Claims**



1. A method for the preparation of a spherical hob for generation of a gear, which comprises rotating a spherical hob blank about an axis passing through the center thereof and simultaneously rotating a cutting tool having a profile corresponding to a tooth space of an involute gear about the center of said hob blank and along the peripheral surface of said hob blank on a plane passing through said axis, thereby to form projections having a section in the form of an involute tooth profile spirally on the peripheral surface of the hob blank, then forming by cutting on the peripheral surface of the hob blank a plurality of equidistantly arranged spaces across said projections, thereby to divide said projections into a plurality of spirally continuous hob blades, each having an involute tooth profile, and finally forming reliefs on the side faces and the peripheral face of the hob blades so that as the blade faces of the hob blades are cut and sharpened the tooth profile of an imaginary gear generated by rotation of the hob about said axis is gradually displaced to attain an addendum to the tooth profile, whereby after cutting and sharpening of the hob blade faces after said faces have become dull from use in cutting gears in gear blanks, shifting of the hob toward a new gear blank by a distance corresponding to the magnitude of undercut of the peripheral relief results in cutting in the new gear blank of a gear generated in gear blanks before cutting and sharpening of the blade faces.

4,202,223

APPARATUS FOR REMOVING AN EXPOSED ROLL OF FILM FROM A CAMERA

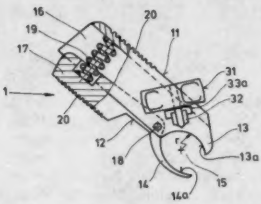
Wolfgang Kehrle, Hauptstrasse 78, Aulendorf, Fed. Rep. of Germany

Filed Feb. 23, 1978, Ser. No. 880,465

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1977, 2709638

Int. Cl.[2] B25B *9/00*; **B25F** *1/00*

U.S. Cl. 81—3 R **10 Claims**



1. An apparatus for removing a roll of film on a film spool having side flange portions from a camera comprising, a top tong arm having a top grip portion and a top handle portion, a bottom tong arm movably mounted on said top tong arm having a bottom grip portion and a bottom handle portion, said top and bottom grip portions defining a film roll engagement mouth which is openable and closeable by moving said bottom handle portion in respect to said top handle portion, said film engagement mouth being openable to admit a roll of film on a film spool and closeable to closely engage around the roll of film, at leat one of said top and bottom grip portions including spaced apart lateral guide faces respectively engageable with the film spool side flange portions for preventing lateral displacement of the film spool when the roll of film on the film spool is engaged in said film roll engagement mouth, and tensioning knob mounted for rotation on one of said top and bottom grip portions engageable with the film spool for rotating the film spool when the film is embraced between said top and bottom guide portions to tightly wind the film on the spool, said tensioning knob being pivotably connected to said one of said top and bottom tong arms to swing into and out of engagement with the film spool.

4,202,224

APPARATUS FOR ROTATING OF TRACK BUSHING BY COMBINED STATIC AND DYNAMIC TORQUE

James A. Hooker; Dean W. Martin, and Shellie O. Williamson, all of Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed May 24, 1978, Ser. No. 909,148

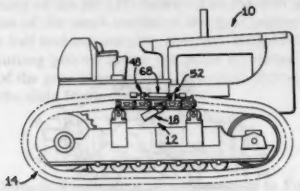
Int. Cl. B25B *9/00, 13/48*

U.S. Cl. 81—3 R **7 Claims**

1. Apparatus for rotating a track pin bushing, the track being of the type wherein links are connected on one end by track pins and on the other end by bushings, said apparatus comprising:

a first member securable to one of a pair of track links;

a second member securable to the other of that pair of track links;



exciter means interconnecting the first and second members for providing a vibratory motion therebetween; and

means for applying a rotational force to said bushing.

4,202,225

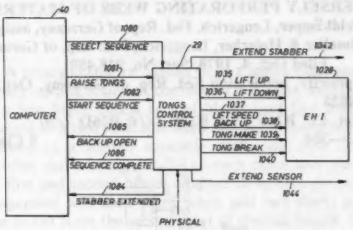
POWER TONGS CONTROL ARRANGEMENT

Loren B. Sheldon, 8226 Bairnsdale, Houston, Tex. 77070; James R. Tomashek, 114 E. Division St., Wood Dale, Ill. 60191, and Donald H. Ward, 418 Ridgewood, Glen Ellyn, Ill. 60137

Continuation of Ser. No. 777,926, Mar. 15, 1977, abandoned. This application Apr. 4, 1979, Ser. No. 26,820

Int. Cl.² B25B *13/50*

U.S. Cl. 81—57.35 **22 Claims**



1. Apparatus for controlling a tongs arrangement having (a) a tongs lift, (b) means for controlling the lift speed, (c) a backup tong, and (d) a power driven tong, said apparatus comprising:

means for generating a signal to lift the backup and the power driven tong at a predetermined speed to a predetermined elevation;

means for generating a first feedback signal representative of the tongs being disposed at the predetermined elevation;

means responsive to the first feedback signal for generating a signal to close and lock the backup tong when it is lifted to the predetermined elevation;

means for generating a second feedback signal representative of the closure and locking of the backup tong; and,

means responsive to the second feedback signal for generating a signal to drive the power driven tong when the backup tong is closed and locked.

4,202,226

METHOD AND APPARATUS FOR MANUFACTURING PLASTIC LENSES

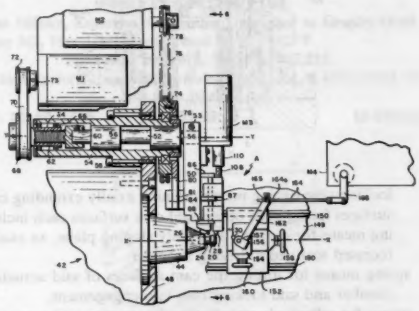
Ronald K. Becker, Arlington, and Donald R. Korb, Boston, both of Mass., assignors to SyntexLaboratories, Inc., Palo Alto, Calif.

Filed Feb. 6, 1978, Ser. No. 875,394

Int. Cl.² B23B *5/40*

U.S. Cl. 82—12 **29 Claims**

1. Apparatus for forming lenses from blanks comprising means for supporting a blank for rotation about a predetermined axis, a turning tool and a facing tool, means mounting the turning tool and facing tool for rectilinear movement in unison parallel to the axis of rotation of the blank in predetermined axially spaced relation such that rectilinear movement of said tools moves the turning tool from the distal end of the blank to the proximal end thereof to generate a cylinder of predetermined diameter and moves the facing tool to a ready position adjacent the distal end of the blank simultaneously with arrival of the turning tool at the proximal end of the blank, means for then moving the facing tool a predetermined distance at right angles to the axis of rotation to generate a flat annular surface at right angles to the axis of rotation at said end, means for retracting the tools, a tool for generating a sphericaly concave base cut in the distal end of the blank of predetermined radius of curvature, means supporting said latter tool at the level of the axis of rotation for movement along said axis toward the distal end of the blank, means for oscillating said latter tool through an arc commencing outside the radius of the blank and terminating at the axis of rotation, means for moving the latter tool while oscillating toward the distal end of the blank to generate a spherically concave surface of predetermined depth relative to said annular surface bounded by a portion of the annular surface and means for retracting said latter tool at said predetermined depth.



21. Apparatus for forming lenses from blanks comprising means for supporting a blank for rotation about a predetermined axis and means for effecting rotation of the means supporting the blank, a turning tool and facing tool, a support mounting the tools, said support being movable rectilinearly parallel to said axis and for rotation in a plane perpendicular to said axis, motor means for rotating said suppport from an out-of-the-way retracted position to a position adjacent said axis, such that the tools supported thereby are in operative position, motor means for effecting rectilinear movement of the support to move one of the tools parallel to said axis at a predetermined radial distance therefrom to generate a cylindrical surface, motor means operable at the end of the turning operation to move the other tool radially inwardly a predetermined distance to generate a face cut, means operable at the end of the face cut to reverse the first motor means to retract the tools and means operable at the retracted position of the tools to effect operation of the second motor means to return the tools to their initial position.

4,202,227

MULTIPLE POSITION TOOL HOLDER

Helmut Thumm, Metzingen, Fed. Rep. of Germany, assignor to Sauter Feinmechanik GmbH, Fed. Rep. of Germany

Filed Sep. 14, 1978, Ser. No. 942,185

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1977, 2741907

Int. Cl.² B23B *29/28*

U.S. Cl. 82—36 A **4 Claims**

1. A positionable tool holder for supporting a plurality of tools and means for selectively repositioning the tool holder

for use in combination with a turning machine, comprising the combination of

a fixed mounting member;

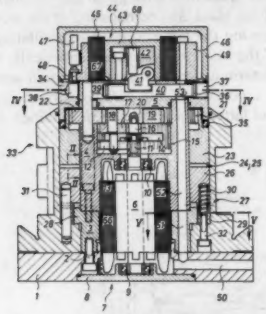
a tool carrier rotatable about a fixed axis relative to said mounting member;

means for releasably interconnecting said carrier and said mounting member, said means including

a plurality of teeth on said tool carrier, and

a toothed locking ring axially movable between a locking position in which the teeth on said ring engage the teeth on said carrier and an unlocked position in which the said teeth are disengaged;

an actuating member mounted for engagement with said locking ring, each of said actuating member and said



locking ring having means defining axially extending cam surfaces facing each other, said cam surfaces each including means for defining an axially sloping plane, an axially recessed seat and a driving shoulder;

spring means for urging the cam surfaces of said actuating member and said locking ring into engagement;

means for selectively coupling said carrier to said mounting member to prevent rotation thereof, said means including a movable bolt; and

a reversible rotary drive motor supported on said mounting member, said drive motor and said means for coupling being energizable together, when said drive motor is driven in a direction reverse to the direction of rotation of the tool carrier.

4,202,228

METHOD OF CUTTING SLABS FROM A BODY OF UNCURED, LIGHT-WEIGHT CONCRETE AND AN APPARATUS FOR CARRYING OUT THE METHOD

Rolf E. Göransson, Akarp, Sweden, assignor to Internationella Siporex AB, Malmo, Sweden

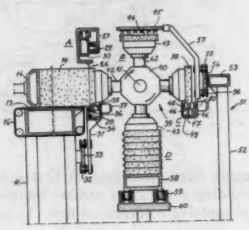
Filed Jun. 29, 1978, Ser. No. 920,337

Claims priority, application Sweden, Jun. 30, 1977, 7707610; Jun. 30, 1977, 7707611

Int. Cl.[2] **B26D** *7/06, 1/44*

U.S. Cl. 83—23 **16 Claims**

1. A method of cutting a slab from a body of uncured, light-weight concrete resting on a longitudinally extending support surface, comprising: moving a body of uncured light-weight concrete along the longitudinal reach of said support surface through a predetermined distance, said body having a front face perpendicular to said longitudinal reach; supporting said front face of said slab; cutting a slab from said body while supporting said front face; moving said slab away from said body along an extension of said longitudinal axis; and subsequently moving the slab along at least one arcuate movement



path in a plane perpendicular to said support surface and parallel to said longitudinal axis.

4,202,229

APPARATUS FOR TRANSVERSELY SEVERING OR TRANSVERSELY PERFORATING WEBS OF MATERIAL

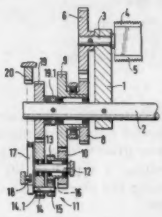
Richard Feldkämper, Lengerich, Fed. Rep. of Germany, assignor to Windmoller & Holscher, Lengerich, Fed. Rep. of Germany

Filed Oct. 4, 1978, Ser. No. 948,498

Claims priority, application Fed. Rep. of Germany, Oct. 31, 1977, 2748826

Int. Cl.[2] **B26F** *1/08;* **B31B** *1/14;* **B26D** *7/00*

U.S. Cl. 83—304 **5 Claims**



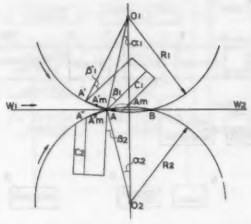
1. Apparatus for transversely severing or transversely perforating webs of material, preferably paper webs in the production of paper sacks, comprising a grooved shaft mounted in the frame of the apparatus and at least one knife shaft which carries at least one knife, is rotatably mounted in revolving end plates eccentrically to the shaft thereof and is driven by way of a spur gear on the knife shaft from an intermediate gear freely rotatable in one of the end plates and a central gear which meshes with the intermediate gear, is coaxial with the end plates and is freely rotatable relatively thereto, characterised in that a gear (**19**) secured to the end plate shaft (**2**) engages at least one spur gear (**14**) mounted on a pin (**12**) fixed with respect to the frame or a shaft (**12'**) mounted in the frame, a further spur gear (**10**) which is mounted or secured on the pin or shaft, respectively, meshing with a gear (**9**) connected to the central gear (**8**) by a tubular strut to form a gear set, that the gears (**10, 14**) mounted on the pin or secured on the shaft are coupled by variable speed gearing comprising a gear segment (**16**) which is connected to the gear (**10**) meshing with the gear set (**8, 9**) and which engages a countersegment (**13**) secured to a freely rotatable pin (**15**) eccentrically mounted on the other spur gear (**14**), the other end of the pin (**15**) carrying a slotted guide (**17**) sliding on a slide block (**18**) fixed with respect to the frame, that

the slide block (18) is disposed at a radial spacing from its medial plane of the fixed pin or shaft corresponding to half the eccentricity of the pin (15) mounted on the spur gear (14), that the radius of the pitch circles of the gear segments (13, 16) is likewise half said eccentricity, and that the knife (4, 5) projects into a cutting groove when the point of contact of the pitch circles of the gear segments (13, 16) passes through the centre-line of the slide block (18).

4,202,230
ROTARY CUTTER

Akira Obinata, Fujinomiya, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Jul. 17, 1978, Ser. No. 925,337
Claims priority, application Japan, Jul. 15, 1977, 52-84696
Int. Cl.[2] B26D *1/40*; B23D *25/02*
U.S. Cl. 83—345 **1 Claim**



1. A rotary cutter for cutting from a web a sheet and simultaneously cutting rounded corners on the sheet, said cutter having a first blade and a second blade, said first blade fixedly mounted to a first rotatable shaft and said second blade fixedly mounted to a second rotatable shaft, said first and second rotatable shafts being parallel to each other and spaced apart, said first and second blades adapted to be brought into cutting engagement wth each other when said two shafts are rotated so as to cut from the web a sheet of desired length, the rotary cutter satisfying the following conditions:

(a) said first and second blades having the same blade contours with respect to a common curved edge line defining a plane;

(b) each blade at each position of engagement satisfying the relationship of $\beta \cong \alpha$; and

$$R_1/R_2 = AA'/AA'' \quad (c)$$

wherein:

β is the relief angle of each blade,

α is the nip angle of each blade,

R_1 is the radius of rotation of the first blade,

R_2 is the radius of rotation of the second blade,

AA′ is the edge line length of the first blade, and

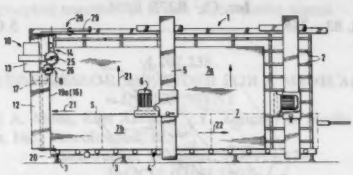
AA″ is the edge line length of the second blade.

4,202,231
DEVICE FOR CUTTING BUILDING PANELS

Ludwig Striebig, Grossmatte, CH 6014 Littau, Switzerland

Filed May 24, 1978, Ser. No. 908,968
Claims priority, application Switzerland, May 26, 1977, 6516/77
Int. Cl.[2] B27B *5/06*; B26D *7/02*
U.S. Cl. 83—453 **14 Claims**

1. A device for cutting a panel comprising: a frame; a vertically extending grid defining a working surface for a panel to be cut while supported by said grid; horizontally extending carrier means adapted to have said panel resting edgewise thereon while being supported by said working surface during cutting of said panel; a power saw mounted on said frame for movement in said working surface; an elongated guide column secured to said frame; stop means on said guide column for bounding said working surface in one horizontal direction by abutting engagement with a vertically extending edge portion of said panel; said guide column being vertically extending

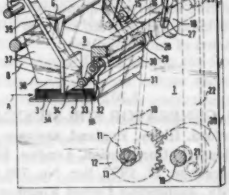


adjacent said edge portion when said edge portion is engaged by said stop means; and clamping means vertically movable on said guide column for clamping said edge portion to said column.

4,202,232
APPARATUS FOR TRIMMING STACKS OF PAPER SHEETS OR THE LIKE

Hans Müller, Zofingen, Switzerland, assignor to Grapha-Holding AG, Hergiswil, Switzerland

Filed Jun. 21, 1978, Ser. No. 917,522
Claims priority, application Switzerland, Jul. 2, 1977, 8122/77
Int. Cl.[2] B26D *5/08*
U.S. Cl. 83—519 **10 Claims**

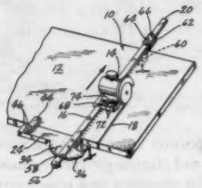


2. Apparatus for trimming the front, head and foot ends of a series of successive stacks of paper sheets or the like, comprising a single trimming station including means for supporting one stack of said series at a time; a first knife for trimming the front end of the stack on said supporting means; two additional knives for simultaneously trimming the head and foot ends of the stack on said supporting means; and means for cyclically operating said knives, including first means for moving said first knife into trimming engagement with the front end of the stack on said supporting means during a first portion of a cycle and second means for simultaneously moving said additional knives into trimming engagement with the respective ends of the same stack on said supporting means during a subsequent portion of the same cycle, including a holder for said first knife, said first knife being movable with respect to said holder in directions toward and away from said additional knives, said operating means further including third means for moving said first knife away from said additional knives upon completion of trimming of the front end of the stack on said supporting means so that said first knife is spaced apart from said additional knives during movement of said additional knives toward and during trimming engagement of said additional knives with the stack on said supporting means, including a mobile cam and follower means operatively connected with said first knife, said second means including means for moving said cam.

4,202,233
SAW GUIDE DEVICE

Keith J. Larson, 7108 Palm Dr., Urbandale, Iowa 50322

Filed Apr. 17, 1978, Ser. No. 896,805
Int. Cl.[2] B27B 9/04
U.S. Cl. 83—745 5 Claims

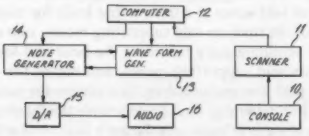


1. A tool guide comprising in combination,
a saw guide bar which is solid and rectangular in cross-section for extension across a work piece, said bar having a forward end and a rearward end,
an anchor plate attached near said rearward end of said guide bar to allow pivotal movement of said guide bar with respect to said plate;
clamping means on said plate to clamp said plate to a work piece, and to releaseably clamp said guide bar to predetermined fixed positions with respect to said anchor plate; and
a tool base pad having a groove therein adapted to slidably fit over said guide bar for lengthwise sliding along said bar and which can be lifted upwardly and off of said bar, said base pad being constructed of a material different than said guide bar and selected to reduce sliding friction between said guide bar and said base pad, and
pressure sensitive adhesive strip means on said pad to attach a powered hand tool thereto without altering the structural elements of such hand tool.

4,202,234
DIGITAL GENERATOR FOR MUSICAL NOTES

Peter J. Comerford, Ilkley, England, assignor to National Research Development Corporation, London, England

Filed Apr. 27, 1977, Ser. No. 791,428
Claims priority, application United Kingdom, Apr. 28, 1976, 17276/76
Int. Cl.[2] G10H 1/00
U.S. Cl. 84—1.01 29 Claims

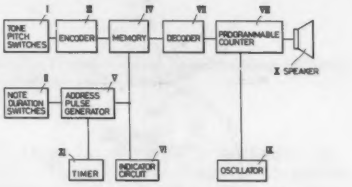


1. A digital generator for musical notes comprising means for producing selection signals each of which indicates the selection of a defined set of a plurality of harmonic structures, each structure being associated with at least one note in dependence on the pitch of the note, and means for producing further selection signals each of which indicates the selection of a note having a predetermined pitch and a predetermined harmonic structure within a selected one of said sets, digital computing means programmed to be responsive to each selection signal to produce harmonic data and control signals, storage data and control signals and sample-selection data and control signals, synthesising means responsive to the harmonic data and control signals for synthesising digital data representing reference waveforms, means responsive to the storage data and control signals for storing the reference waveform data and sampling means responsive to the sample-selection data and control signals for selectively sampling the stored reference waveform data to so derive further digital data representing the predetermined harmonic structure of the selected note that the structure is selected from one of the said defined sets in accordance with the pitch of the selected note, the rate of sampling being effective to determine the pitch of the note when the note is reproduced from the further digital data.

4,202,235
ELECTRONIC MUSICAL BOX

Yasushi Namiki, Higashi-Yamato; Akira Terashima, Hatano, and Naomi Yoshizawa, Hiratsuka, all of Japan, assignors to Pilot Man-Nen Hitsu Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 31, 1978, Ser. No. 873,829
Claims priority, application Japan, Dec. 9, 1977, 52-147830
Int. Cl.[2] G10H 5/00; G04B 21/08
U.S. Cl. 84—1.01 9 Claims



1. An electronic musical box comprising:
pulse generator means for generating a unitary pulse for a note whose duration is the shortest in a given musical score and generating integer numbers of unitary pulses for the other notes therein;
tone pitch signal generating means for generating coded tone pitch signals coded by a plurality of tone pitch switches so as to correspond to the tone pitches of the notes in said musical score;
memory means having a plurality of addresses and responsive to said pulse generator means for storing each of said coded tone pitch signals in a number of successive addresses of said memory, said number being equal to the number of unitary pulses generated by said pulse generator means; and
musical tone generating means for reading data stored in said memory means thereby obtaining musical tones from the outputs of said memory means at a desired time.

4,202,236
CHORD PATTERN GENERATOR

Brian N. Wilcox, and John W. Robinson, both of Jasper, Ind., assignors to Kimball International, Inc., Jasper, Ind.

Filed May 11, 1978, Ser. No. 904,741
Int. Cl.[2] G10H 1/02, 5/06
U.S. Cl. 84—1.03 13 Claims

1. A chord pattern generator for an electronic organ comprising:
a source of tone signals of diverse pitches,
output circuitry including acoustic transducer means,
a plurality of keyers each having outputs connected to said output circuitry,
keyboard controlled means for simultaneously connecting selected ones of said tone signals respectively to diverse said keyers such that only one said tone signal is connected to any one of said diverse keyers,
at least three selectively activated envelope control means individually connected respectively to said diverse keyers for causing said diverse keyers to key respective said tone signals to said output circuitry in respective envelopes having predetermined attack and decay characteristics,
a memory in which a plurality of note patterns are stored,

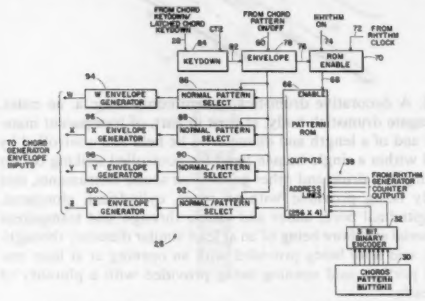
means for selecting one of said stored patterns, and

means for addressing said memory at a rhythmic rate to activate said three envelope control means in accordance with the selected pattern.

11. In an electronic organ having a source of tone signals of diverse pitches, output circuitry including an acoustic transducer, and a plurality of keyers each having outputs connected to the output circuitry, a method for generating patterns of tones corresponding to notes of a selected chord comprising:

selecting a plurality of said tone signals,

simultaneously connecting said selected tone signals respectively to diverse keyers such that only one tone signal is connected to any one of the keyers,



storing a plurality of note patterns in a memory,

selecting one of the stored note patterns,

providing at least three selectively activated envelope generators connected respectively to the keyers, and

addressing the memory at a rhythmic rate to activate the three envelope generators in accordance with the selected pattern to cause said keyers to key respective said selected tone signals to said output circuitry in respective envelopes having attack and decay characteristics pertaining to the respective envelope generators connected to the keyers.

4,202,237

DEVICE FOR PRODUCING SOUNDS, WHICH CAN BE COUPLED TO A MUSICAL INSTRUMENT

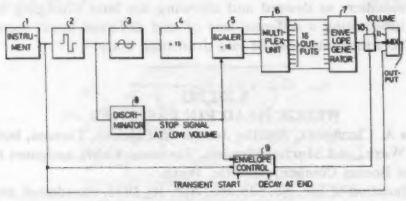
Bjarne C. Hakänsson, Täby, Sweden, assignor to Lindën & Linder AB, Stockholm, Sweden

Filed Mar. 14, 1978, Ser. No. 886,615

Claims priority, application Sweden, Apr. 14, 1977, 7704290

Int. Cl.[2] **G10H** *5/06, 5/10*

U.S. Cl. 84—1.24 **4 Claims**



1. Device for producing sounds which can be coupled to a musical instrument characterized by means disposed to extract a fundamental frequency from a signal coming from said musical instrument; means for multiplying said fundamental frequency to obtain a frequency which is n times as high as the fundamental frequency, n being an integer; counting means with n outputs, coupled to the frequency n times as high as the fundamental in order to give off output signals at this higher frequency, sequentially and cyclically from the n outputs, each output giving off an output signal at the same frequency as said fundamental frequency extracted from the instrument signal, said n outputs each being coupled to an individual adjustable attenuation circuit, the output signals of said attenuation circuit being coupled together to create a composite signal.

4,202,238

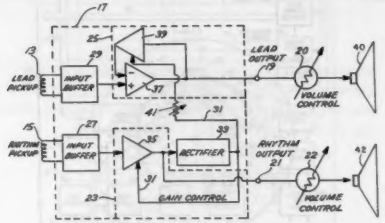
COMPRESSOR-EXPANDER FOR A MUSICAL INSTRUMENT

Robert A. Moog, East Aurora, N.Y., assignor to Norlin Industries, Inc., Lincolnwood, Ill.

Filed Jun. 1, 1978, Ser. No. 911,476

Int. Cl.[2] **G10H** *1/02*

U.S. Cl. 84—1.27 **27 Claims**



1. Apparatus for controlling the output sound of a musical instrument according to the strength of sound produced by the musician, comprising:

transducer means for generating first and second audio signals in response to the playing of the instrument;

control signal means for producing a control signal whose magnitude is related to the strength of sound produced by the musician;

signal compressor means for receiving the first audio signal and generating a compressed output thereof, said compressor means responsive to said control signal for providing compression of said first audio signal according to said control magnitude; and

signal expander means for receiving the second audio signal in substantial time coincidence with receipt of said first audio signal by said signal compressor means and generating an expanded output of said second audio signal, said expander means responsive to said control signal for providing expansion of said second audio signal according to the control signal magnitude.

4,202,239

TONE GENERATOR KEYER CONTROL SYSTEM

James S. Southard, Union, and Daniel R. Mott, Dowagiac, both of Mich., assignors to C. G. Conn, Ltd., Oak Brook, Ill.

Filed Jan. 9, 1978, Ser. No. 867,908

Int. Cl.[2] **G10H** *1/02, 5/00*

U.S. Cl. 84—1.26 **8 Claims**

1. A method of providing a keyer control system for an electronic musical instrument including a plurality of tone generators each capable of producing tones, means for supplying input signals for said tone generators representative of different tones to be produced by said system, assignment circuit means coupled to said tone generators for enabling different tone generators to produce tones in response to said input signals, each tone generator producing a different tone according to the input signal applied thereto, and a keyer pedestal means coupled with each of said tone generators for controlling decay mode characteristics of the tone produced by the tone generator coupled therewith;

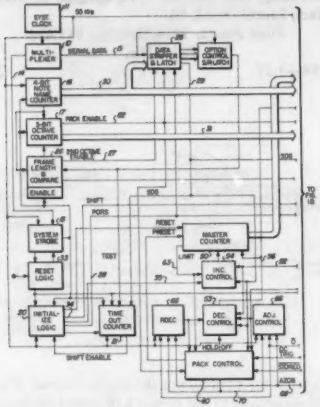
the method comprising the steps of forming a first count in a predetermined sequence of numbers having a total of

different numbers at least equal to the number of tone generators in the system,

assigning a different count of said predetermined sequence of said first count to a tone generator in one of the conditions of not producing a tone and producing a tone in a decay mode in order that each such tone generator is uniquely identifiable by virtue of the count assigned thereto,

causing a tone generator not producing a tone to produce a tone in response to the next new input signal representative of a new note as determined by the counts assigned to the tone generators not producing tones taken in the predetermined sequence of numbers, and

whenever all tone generators are in one of the conditions of producing a tone and producing a tone in a decay mode, causing the tone generator farthest into its decay mode of operation to produce a tone in response to the next new input signal representative of a new note as determined by the counts assigned to the tone generators in the decay mode taken in the predetermined sequence of numbers.



4,202,240

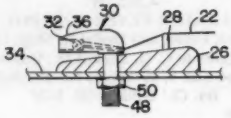
BRIDGE PIN

Gerald E. Smith, 1528 Waterhouse, Chattanooga, Tenn. 37412

Filed Jul. 13, 1978, Ser. No. 924,233

Int. Cl.[2] G10D *3/12*

U.S. Cl. 84—297 R **10 Claims**



1. A bridge pin for securing an anchor of one longitudinally extending guitar string at the bridge of an acoustic guitar, said anchor being enlarged relative to the diameter of said string, said pin comprising an elongated mounting stem with a securing head thereon, said head having a string receiving channel extending in the longitudinal direction of said string, said channel comprising a first section opening at one end of the head and adapted to receive the anchor and string and a second section having a cross sectional dimension smaller than that of said first section, said second section opening at the opposite end of said head than said first section, said cross sectional dimension of said second section being such that the string but not the anchor is receivable therein.

4,202,241

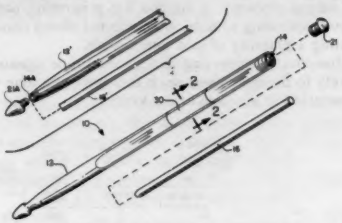
DECORATIVE DRUMSTICK SYSTEM WITH DIFFERENT APPEARING INSERTS

Stephen J. Lucas, 2429 Frenchman St., New Orleans, La. 70119

Filed Jul. 3, 1978, Ser. No. 921,757

Int. Cl.[2] G10D *13/00*

U.S. Cl. 84—422 S **5 Claims**



1. A decorative drumstick system comprising: a. an outer, elongate drumstick body, at least in part, of transparent material and of a length and diameter to be held and controlled by and within a single human hand for controlled striking of, for example, a drum and other percussion sound instruments, said body being provided with an inner, cylindrical, elongated, longitudinal bore, under and visible through said transparent material said bore being of an at least similar diameter throughout, said bore being provided with an opening at at least one end portion, said opening being provided with a plurality of threads;

b. a number of different inner insert members each of substantially the same size as said bore but being of different decorative external appearance, each of said members being slidably and removably receivable on an individual basis into and from said bore, each of said members making a substantially close, tight, immovable fit with said bore when fully inserted and the open end closed off thereinto; and

c. a head removably connectable to the open end portion of said bore at said threads, said head being provided with a plurality of threads which register with and threadably connect said head to said drumstick body of said bore to close off the end of said bore, said head tightly retaining the selected, inserted one of said insert members within said bore when said head is tightly connected to said body at said threads; said drumstick body being substantially transparent, around at least a substantial portion of said bore, and said inner, selected inserted member being colored, said insert member being visible through said outer drumstick body when said insert member has been fully placed within said drumstick body; the same drumstick body being usable to give off different decorative appearances by inserting a selected one of said different insert members as desired and allowing for later changing by substituting a different one of said different insert members into said bore of said drumstick body.

4,202,242

WEDGE HEAD PIN FASTENER

Louis A. Champoux, Seattle; Joseph G. Falcioni, Tacoma, both of Wash., and Morton Mendels, Torrance, Calif., assignors to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 615,205, Apr. 10, 1975, abandoned, and a continuation of Ser. No. 400,334, Sep. 24, 1973, abandoned.

This application Feb. 23, 1977, Ser. No. 771,318

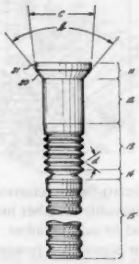
Int. Cl.[2] F16B *35/06*

U.S. Cl. 85—7 **13 Claims**

7. A wedge head pin fastener for securing together a plurality of overlapped work members having an opening therethrough, said opening having first and second countersink surfaces, said second countersink surface extending axially inwardly from the intersection of said opening and an outer surface of said work members and having a taper angle of less

than 20°, said first countersink surface being disposed axially inwardly from said second countersink surface, said pin fastener comprising:

a head having an end face and first and second tapered sections for engagement with said first and second countersink surfaces, respectively, said first tapered section having a taper angle of from 70° to about 100° and being sufficiently large to substantially prevent pull-through of said pin fastener in said opening when engaged upon said first countersink surface, said second tapered section being axially adjacent said end face, having a taper angle of less than 20° but exceeding said taper angle of said second countersink surface, and being sized so that, upon forcible insertion of said pin fastener into said opening, said second



countersink surface is diametrically enlarged and forms an interference fit with said second tapered section, whereby a structural joint is formed wherein said second countersink surface is pushed out to conform to the taper angle of said second tapered section so that effects of stresses are shifted to the interior of the structural joint, and;

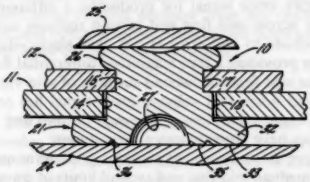
a shank depending from said head, said shank having a securing portion thereon, said securing portion including a plurality of circumferential grooves and a plurality of circumferential rings formed intermediate said circumferential grooves, each said rings having an apex and each of said grooves having a base adjacent apexes and bases, being joined by substantially straight ring sides, adjacent ring sides of each of said rings forming a ring angle at their apexes of from 55° to 65°.

4,202,243

SELF-COMPENSATING RIVET

Robert F. Leonhardt, Roscoe, Ill., assignor to Atwood Vacuum Machine Company, Rockford, Ill.

Filed Jul. 31, 1978, Ser. No. 929,215
Int. Cl.² F16B *5/04, 19/06*
U.S. Cl. 85—37 **10 Claims**



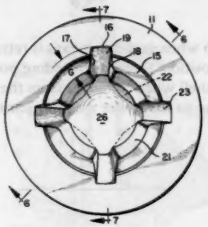
1. A self-compensating rivet in unstaked form and comprising first and second integral and coaxial shank portions and further comprising an integral and coaxial head said second shank portion being located between said first shank portion and said head and having a predetermined diameter greater than the diameter of said first shank portion and less than the diameter of said head, said head having a substantially flat annulus disposed in a radial plane and defining an anvil-engaging surface, the inner diameter of said flat annulus being no greater than the diameter of said second shank portion, the outer diameter of said flat annulus being greater than the diameter of said second shank portion, a counter-recess centered within said annulus and defined by inner and outer recesses, said outer recess having a diameter greater than the diameter of said inner recess and defining the inner diameter of said flat annulus.

4,202,244

RECESSED HEAD SCREW

Charles E. Gutshall, Rockford, Ill., assignor to Technofast, Inc., Willowbrook, Ill.

Filed Jul. 26, 1978, Ser. No. 928,108
Int. Cl.² F16B *23/00*
U.S. Cl. 85—45 **4 Claims**



1. In a screw having a head provided with a cruciform recess comprising a plurality of radially extending slots, said recess being adapted to received a driving tool provided with flutes which engage said slots, the improvement wherein:

said recess comprises a generally frusto-conical central socket portion having sidewall concave sections interconnecting adjacent slots and a generally spherical bottom surface;

each of said slots comprises a pair of opposed sidewalls and a generally sloping bottom wall interconnecting said sidewalls, said opposed sidewalls being symmetrically inclined relative to the axis of said screw, said bottom wall of each of said seat joining a single one of said sidewalls in a concave camming surface extending along at least a portion of the depth of said slot;

whereby on insertion of said driving tool, a flute of said tool which enters a slot in said head is cammed between said concave surface and the opposite sidewall of said slot, creating a frictional engagement between said tool and said screw.

4,202,245

SHELL RELOADER WITH AUTOMATIC EJECTION

Larry W. McSpadden, P.O. Box 343, Mountain View, Ak. 72560

Filed Apr. 3, 1978, Ser. No. 892,651
Int. Cl.² F42B *33/10*
U.S. Cl. 86—36 **6 Claims**

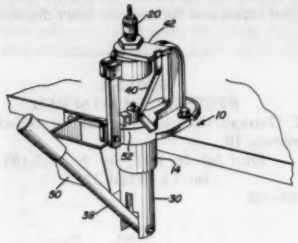
1. A cartridge shell press comprising

a frame member having a lateral access opening, an upper shell-receiving portion, and a lower ram-receiving portion, said frame member being adapted to receive a die assembly mounted on said frame adjacent said shell-receiving portion, and aligned to receive a shell member thrust upwardly in said shell-receiving portion;

vertically-movable ram means adapted for moving a shell member along a travel path towards the position of said die assembly and adapted for holding a shell member;

means for moving said ram means upwardly from an intermediate shell engagement position toward an upper die-engaging position and downwardly toward a lower shell ejection position; and

spring means extending laterally into the travel path of said shell member, said spring means being deflected outwardly by said ram means in said intermediate shell engagement position and adapted for spring return into said



travel path when said ram means is retracted to said lower ejection position, thereby providing positive ejection of a cartridge shell when retracted from the uppper die-engaging position to the lower ejection position.

4,202,246

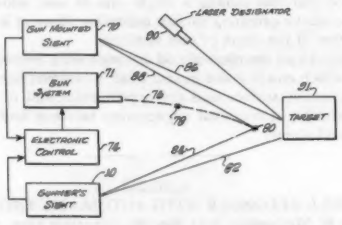
MULTIPLE CO-AXIAL OPTICAL SIGHT AND CLOSED LOOP GUN CONTROL SYSTEM

Charles W. Schertz, and Edward H. Ritter, both of Claremont, Calif., assignors to General Dynamics Pomona Division, Pomona, Calif.

Continuation-in-part of Ser. No. 469,280, May 13, 1974, abandoned, which is a division of Ser. No. 404,077, Oct. 5, 1973, Pat. No. 4,040,744. This application Jun. 23, 1975, Ser. No. 591,381

Int. Cl.[2] **F41G** *3/22*

U.S. Cl. 89—41 EA **14 Claims**



1. In a closed-loop gun control system, that improvement comprising:

an ammunition round having a delayed timed flash and an impact flash, said timed flash having an optical energy output that is invisible and different from said impact flash.

an optical energy detection system for detecting energy generated by the timed flash and the impact flash of said ammunition round, including,

optical sight means operably associated with said ammunition round for establishing a desired line of fire,

said optical sight means including optical energy detector means for determining the angular displacement and orientation of said timed flash and said impact flash from the desired line of fire.

4,202,247

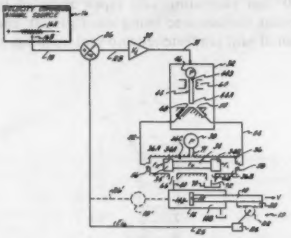
CLOSED LOOP ELECTRO-FLUIDIC CONTROL SYSTEM

Denes B. Hunkar, Cincinnati, and Hans Ortlepp, Loveland, both of Ohio, assignors to Hunkar Laboratories, Inc., Cincinnati, Ohio

Division of Ser. No. 737,031, Oct. 29, 1976, Pat. No. 4,132,152. This application Jun. 7, 1978, Ser. No. 913,301

Int. Cl.[2] **F15B** *13/16, 13/044*

U.S. Cl. 91—364 **7 Claims**



1. A closed loop electro-fluidic control system for controlling the velocity of a movable member induced by the application of pressurized fluid to said member, said system having a zero steady state error signal for nonzero steady state controlled velocities, comprising:

a source of analog d.c. electrical signals correlated to a desired velocity of said movable member,

velocity transducing means responsive to movement of said member for providing analog d.c. electrical signals correlated to the instantaneous actual velocity of said member,

nonintegrating circuit means responsive to said desired velocity and actual velocity signals for providing an analog d.c. velocity error signal correlated to the instantaneous difference between said desired and actual velocities of said movable member, said error signal being zero when said desired and actual velocity signals have equal nonzero magnitudes,

a valve having a first opening connected to a source of pressurized fluid, a second opening connected to provide fluid flow to said movable member in varying degrees, a third opening connected to a reservoir, a movable valve closure element, said valve closure element having first and second surfaces, said valve closure element being movable between first and second limits of travel when subjected to a differential fluidic force across said first and second surfaces to simultaneously vary in direct relationship the sizes of said first and third valve openings to extents dependent on the variable position of said valve closure element relative to said first and third openings,

an electro-fluidic transducer responsive to said analog d.c. velocity error signal for producing a differential fluidic force across said first and second surfaces correlated in magnitude to said error signal, said electro-fluidic transducer providing a zero magnitude differential fluidic force across said first and second surfaces of said valve closure element when said velocity error signal has zero magnitude under conditions where said desired and actual velocities have equal nonzero magnitudes,

said valve closure element having a predetermined position intermediate said first and second limits of travel wherein substantially no fluidic flow paths exist between said second opening and each of said first and third openings, and

said valve closure element and said electro-fluidic transducer having no interconnection therebetween to return said valve closure element to said predetermined position when said velocity error signal is zero, said valve closure element being subjected solely to forces from said electro-fluidic transducer and remaining displaced from said predetermined position in the absence of force applied

thereto by said electro-fluidic transducer once displaced therefrom by forces applied by said electro-fluidic transducer in response to a nonzero error signal input to said electro-fluidic transducer which has subsequently returned to zero upon reaching steady state.

4,202,248

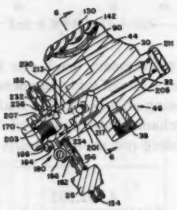
ROTARY VALVE

Jerome T. Ewald, South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Filed Mar. 31, 1978, Ser. No. 892,441

Int. Cl.[2] F15B *9/10*

U.S. Cl. 91—375 A **6 Claims**



1. In a vehicle having an integrated control mechanism for controlling the development of independent power assist to augment an operator input in the operation of a brake system and a steering system, a rotary valve mechanism for the steering system comprising:

a housing having a bore therein with a inlet connected to a source of fluid pressure, first and second operational ports, and an outlet connected to a reservoir;

a torsion bar with at least a portion thereof located in said bore, said torsion bar having a first end fixed to said housing and a second end, said torsion bar including an annular rib on the peripheral surface thereof, said rib engaging the wall of said bore to prevent communication of fluid from the inlet to the outlet along the wall of said bore, said torsion bar also including an axial bore and first and second radial bores, said first radial bore communicating said axial bore with said outlet and said second radial bore communicating said axial bore with said inlet and with said operational ports, said torsion bar further including a plurality of slots on the peripheral surface thereof, said fluid pressure being communicated from the inlet to the outlet on paths through said slots, said axial bore, and said first and second radial bores; and

an actuation member connected to said second end of the torsion bar, said actuation member responding to an operator steering input to rotate said torsion bar to restrict the communication of fluid pressure from the inlet to one of said first and second operational ports while opening the communication of fluid pressure from the outlet to the other of said first and second operational ports to develop a power assist for the steering system.

4,202,249

POWER STEERING MECHANISM CONTROL VALVE

Erich Jablonsky, Bobingen, and Dieter Elser, Essingen-Lauterburg, both of Fed. Rep. of Germany, assignors to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Fed. Rep. of Germany

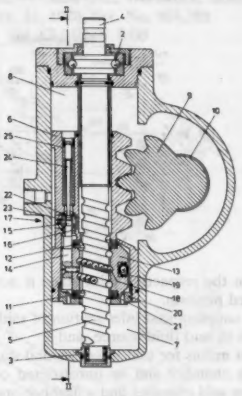
Filed Aug. 23, 1977, Ser. No. 826,989

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1976, 2638981

Int. Cl.[2] F15B *13/04, 13/14*

U.S. Cl. 91—422 **17 Claims**

1. In a power steering mechanism of the kind having a housing with pressure chambers and a double acting piston member (6, 306, 406,(406) therebetween and having a manually operated steering spindle entering said piston with a worm thread on said steering spindle and a coacting worm nut member (13, 313, 413, (413) therearound carried by said piston member with relative rotation and also having a mechanically actuated control valve comprising a valve spool member (23, 323, 423, (423) carried by said piston member with mechanical actuator means (14, 314, 414, (414) carried by said worm nut member connecting to said valve spool member for shifting said valve spool member upon rotation of said steering spindle, wherein rotation of said steering spindle effects said relative rotation of said worm nut member to stress a flexure means (24, 30, 40, 50, 60) during shifting of said valve spool member by said actuator means to control pressure and exhaust flow means for operating said piston; and wherein said flexure means is stressed upon occurrence of said relative rotation by rotation of said steering



spindle; the improvement which comprises said flexure means comprising an elongated flexure rod (20, 30, 40, 50, 60) extending longitudinally of said piston and worm nut members and having an end secured to one (6, 306, 413,(413) of said members and an end movable with one of the other (13, 313, 406,(406) of said members, said movable flexure rod end moving when said valve spool member is being shifted by said relative rotation; said flexure rod being bendably stressed upon manual rotation of said steering spindle during said shifting of said valve spool member and said flexure rod having a predetermined flexing characteristic curve for force applied by said steering spindle and effecting steering resistance simulation during a steering operation and effecting entering of said valve spool subsequent to a steering operation; including adjusting means for adjusting the position of said flexure rod in order to adjust said valve spool member to a center or neutral position.

4,202,250

PROGRAMMED UNBALANCED LOAD VALVE SYSTEM

Kenneth W. Zeuner, Newtown, and Alonzo B. Jarman, Wrightstown, both of Pa., assignors to Control Concepts, Inc., Newtown, Pa.

Continuation-in-part of Ser. No. 578,006, May 16, 1975, Pat. No. 3,980,002. This application Sep. 13, 1976, Ser. No. 723,023

Int. Cl.[2] F15B *13/043*

U.S. Cl. 91—449 **6 Claims**

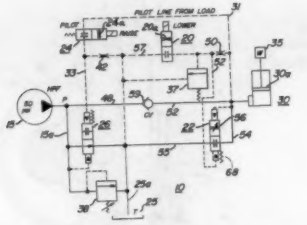
1. A programmed valve system in combination with an unbalanced load means and a fluid source having a raise and lower two stage valve assembly comprising

said raise two stage valve assembly comprising a raise first solenoid operated pilot stage, a raise second valve stage having a chamber and divided into inlet and outlet sections, a raise second valve stage orifice between the sec-

tions within which a raise second stage poppet reciprocates,

said lower two stage valve assembly comprising a lower first solenoid operated pilot stage, a lower second valve stage having a chamber and divided into inlet and outlet sections, a lower second valve stage orifice between the sections within which a lower second stage poppet reciprocates, said load means being coupled to said lower inlet section,

said raise and lower second stage poppets each having an outer substantially parabolic contour to provide a predetermined flow area between the respective orifice and parabolic contour, said first raise and lower pilot stages being respectively coupled to said raise and lower second stages only by fluid communication and whereby said respective raise and lower second stage poppets are controlled in closing with substantially linear flow rate change with poppet within orifice for minimized shock



when the respective pilot stage is actuated to the valve closed position,

means coupling said inlet section of said raise second valve stage to said fluid source, and

dashpot means for said lower second stage poppet and having a chamber and an unrestricted conduit coupled between said chamber and a dashpot opening formed on an outer surface of said dashpot means, said dashpot opening being closed only when engaged by said lower second stage poppet whereby said lower second stage poppet (1) when moving to said open state engages and closes said dashpot opening and pushes said dashpot means to compress fluid in said dashpot chamber thereby damping the rate of opening of said lower second stage poppet and (2) when moving to said closed state disengages from and opens said dashpot opening and said lower second stage poppet is free of and no longer damped by said dashpot means for a substantially rapid closing.

4,202,251

GENERATOR FOR FLOW RATE OF PRESSURIZED FLUID

Marcel Geirnaert, Ternat-Wambeek, Belgium, assignor to S.E.C.A. Société Anonyme Société d'Entreprises Commerciales et Aëronautiques, Belgium

Filed May 10, 1978, Ser. No. 904,374

Claims priority, application Belgium, May 12, 1977, 177519; May 9, 1978, 1187507

Int. Cl.[2] F01B *13/04*

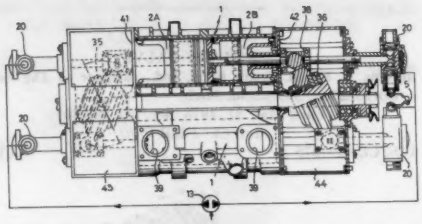
U.S. Cl. 91—472 **5 Claims**

1. Power generator comprising:

(a) body means having three chambers separated from each other by fixed fluid-tight partitions and having a central bore,

(b) shaft means rotatably mounted in the central bore of said body means with at least one end of said shaft means extending from the body means,

(c) at least two drive cylinders mounted in the central one of the chambers in said body means, each of said drive cylinders including two pistons slidably mounted in opposition with each piston having two opposite working faces, the piston rods attached to the corresponding ones of said pistons traversing a respective of said partitions through stationary fluid-tight joints for allowing the piston rods to move therethrough on a pure translational movement, and



(d) two swash plate means, each one being included in a respective lateral one of said chambers, each of said swash plate means being attached to the shaft means and having means for mechanical attachment of the piston rods from the corresponding pistons in said drive cylinders.

4,202,252

THROUGHPUT-ADJUSTABLE FLUID-DISPLACEMENT MACHINE

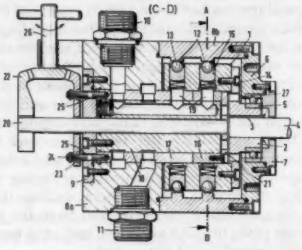
Bernd Scheufler, and Heinz Müller, both of Brunswick, Fed. Rep. of Germany, assignors to Feinmechanische Werke Mainz GmbH, Mainz, Fed. Rep. of Germany

Filed Apr. 12, 1978, Ser. No. 895,661

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1977, 2716496

Int. Cl.[2] F01B *13/06*

U.S. Cl. 91—483 **9 Claims**



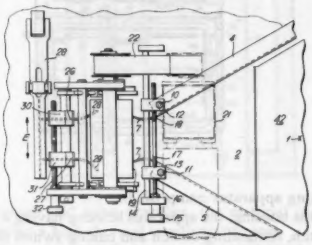
1. A fluid-displacement machine comprising a stator component; a rotor component mounted on said stator component for rotation about an axis relative thereto; two axially spaced circumferentially extending cam tracks both having a sinusoidal shape and being stationary relative to said stator component; means for bounding two sets of radially extending passages in said rotor component, said passages having respective open ends which always face a different one of said cam tracks for each of said sets; a plurality of pistons each accommodated for reciprocation, and bounding a chamber, in one of said passages of said two sets and each having a cam follower portion; means for so biasing each respective piston toward the respective cam track that said cam follower portion thereof follows, and reciprocates the respective piston in dependence on, the configuration of the respective cam track; high-pressure and low-pressure conduits; means for communicating said conduits with said chambers, including two control members each of which is interposed between said conduits and said chambers of one of said sets and each of which is mounted for angular displacement about said axis relative to said stator component; means for simultaneously angularly displacing said two control members in opposite directions relative to said

stator component and for arresting said control members in the respectively assumed positions thereof; each of said cam tracks having a plurality of raised portions uniformly distributed about its circumference; and the ratio of the number m of said passages in each of said sets to the common devisor T of m and of the number of said raised portions per cam track being m/I-5.

4,202,253
STRUCTURAL CELLULAR MATERIALS

Peter John Thwaites, Eltisley, England, assignor to Dufaylite Developments Limited, England

Filed Dec. 4, 1978, Ser. No. 966,240
Claims priority, application United Kingdom, Dec. 8, 1977, 51070/77
Int. Cl.[2] B31D *3/02*
U.S. Cl. 93—1 H **16 Claims**

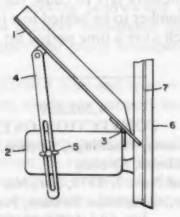


12. A method of treating an unexpanded structural honeycomb material formed of a permanently creasable cellulosic material to convert it to a self-sustaining open cellular state which comprises extending the material in its expansion direction and thereby opening it out to a first open cellular state, further extending the material in said expansion direction while compressing it across said expansion direction to an intermediately compressed state, thereafter engaging the material by driving means extending in driving relationship with the material across the expansion direction thereof to drive said material in the expansion direction and compressing the material across the expansion direction to a compressed closed state in which the cellulosic material is creased, and from which the honeycomb material is expandable, on release, to a second open cellular state, said compression to said compressed closed state being effected by passage of the material through a throat by said driving means.

4,202,254
AIR VENT AUTO'S

Alvin L. Long, Civilian Gen. Del., Beale, A.F.B., Long Ranch, Yuba County, Calif. 95903

Filed Jul. 17, 1978, Ser. No. 925,430
Int. Cl.[2] B06J *1/20*
U.S. Cl. 98—2.12 **1 Claim**

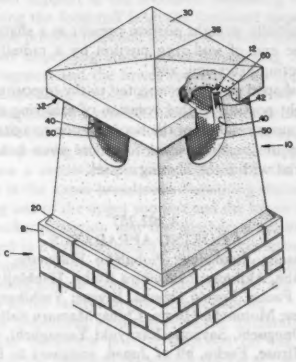


1. A vehicle air deflector for use with a vehicle side door including a vertically movable window, a side view mirror, said side view mirror being mounted inside a ridgid mirror housing on the exterior of the door adjacent the front extremity of the window, a vertical hinge pivotally mounting a side portion of said air deflector against a side wall of said rigid mirror housing, an adjustable arm having one end pivotally mounted against the opposite side of said air deflector, the opposite end of said arm having an elongated slot to be engaged with a fixed threaded vertical pin on top of said mirror housing for regulating the angle of said air deflector with respect to said vehicle and a wing nut adjustably positioned along the threads of said vertical pin whereby said air deflector may be locked in position.

4,202,255
CHIMNEY CAP

Joseph R. McNamara, 90 Dana Ave., Worcester, Mass. 06104

Filed Oct. 23, 1978, Ser. No. 954,301
Int. Cl.[2] F24F *7/00*
U.S. Cl. 98—42 R **1 Claim**



1. A chimney cap which can be conveniently carried to the situs at the upper terminus of a chimney and readily secured thereto comprising, an upright hollow body having walls terminating in upper and lower planar edges, the lower planar edge of the body being secured to the upper terminus of the chimney, a roof seated upon the upper planar edge of the body, the width of the roof being the same as the width of the lower planar edge of the body, the underside of the roof being provided with recesses adjacent each respective corner and the upper planar edge of the body being appropriately complementally configured to snugly seat in said recesses, substantially arcuate recesses extending through the walls of the body adjacent each side thereof, the arcuate recesses communicating at each end thereof with inwardly extending veeshaped slots extending into the walls of the body, and screen members of a configuration adapted to be removably receivable snugly within the annular recesses in the body, the screens having at each side thereof an ear receivable in the respective veeshaped slots.

4,202,256
POPCORN STIRRER

Robert S. H. Brooks, 4419 Fulton St., Sherman Oaks, Calif. 91403

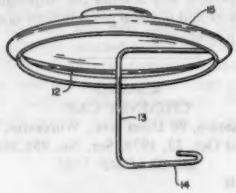
Filed Oct. 23, 1978, Ser. No. 953,560
Int. Cl.[2] B01F *7/16;* **A47J** *36/06;* **A23L** *1/18*
U.S. Cl. 99—323.5 **5 Claims**

1. A stirring rod for use with a heating vessel having a cover incorporating a flange portion internestable and slidable within the upwardly disposed circular periphery of said vessel and extending outwardly therefrom about said periphery to define

an annular groove of given radius internally disposed within said cover,

said cover further including a handle fixed thereto at an outwardly disposed surface thereof,

the rod comprising a resilient wire having a contractable substantially ring-shaped portion formed having a radius greater than said groove radius, the said ring portion being manually contractable for insertion and resilient retention within said groove,



a substantially straight portion present as a shaft connected to one end of said ring portion by a radially inwardly projecting extension, and

a hook-shaped portion connected to the opposite end of the straight portion so that rotation of said ring-shaped portion causes rotation of the hook portion to agitate material within the heating vessel to secure even heating of the material within the heating vessel.

4,202,257

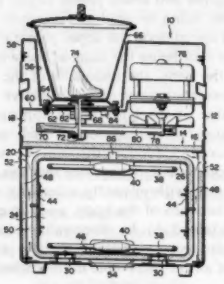
COOKING APPARATUS

Teruo Masuda, Itsukaichi; Nobuhiko Watanabe, Tachikawa; Takeo Abe, Akikawa; Matsuhiro Koike, Hachioji; Masayasu Morita, Fuchu; Yoshio Oguma, Kiyose; Yoshiharu Hamaguchi, Fussa; Motonobu Hirata, Chiba; Mamoru Saito, Koganei; Kunio Onoguchi, Sayama; Kazuyuki Yamaguchi, Oume, and Akira Hirose, Fuchu, all of Japan, assignors to France Bed Co., Ltd., Tokyo, Japan

Filed Nov. 24, 1978, Ser. No. 963,353

Int. Cl.[2] A23L *3/00*

U.S. Cl. 99—348 **5 Claims**



1. A cooking apparatus comprises an apparatus housing, partition means disposed in the apparatus housing to divide the apparatus housing into upper and lower chambers, an oven chamber defined in the interior of the lower chamber and having a baking heater, a vessel disposed on the upper chamber of the apparatus housing and having a shaft extending through the bottom wall of the vessel and an agitating and kneading blade fixed on the free end of the shaft inside the vessel, drive a mechanism disposed in the upper chamber and adapted to impart a rotation force to the shaft, and fermenting means disposed below the bottom of the vessel and having a fermenting heater for the vessel which heats the vessel to a fermenting temperature.

4,202,258

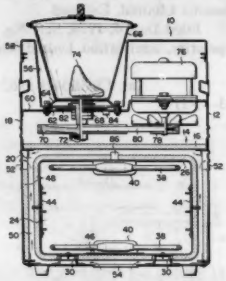
COOKING APPARATUS

Teruo Masuda, Tokyo, and Masayasu Morita, Fuchu, both of Japan, assignors to France Bed Co., Ltd., Tokyo, Japan

Filed Nov. 24, 1978, Ser. No. 963,355

Int. Cl.[2] A23L *3/00*

U.S. Cl. 99—348 **4 Claims**



1. A cooking apparatus comprising:

an apparatus housing, the apparatus housing having a kneading switch, fermenting switch and baking switch thereon;

partition means for separating the apparatus housing into upper and lower chambers;

an oven chamber defined in the lower chamber and having a baking heater therein;

a vessel having a shaft extending through the bottom of the vessel and a kneading blade fixed to the upper end of the shaft interior of the vessel;

fermenting means including a first fermenting heater for the vessel which is disposed below the bottom of the vessel to heat the interior of the vessel to a fermenting temperature, and a second fermenting heater for the oven which is disposed in the oven chamber and which, together with the first fermenting heater for the vessel, is turned ON to preheat the oven chamber;

a thermoswitch coupled to said second fermenting heater for the oven and adapted to sense heat from the second fermenting heater for the oven to effect a temperature control of the second fermenting heater for the oven;

a release switch disposed on the apparatus and housing and coupled to open the kneading switch, fermenting switch and baking switch;

an exclusive time setter, automatic time setter and baking temperature setter each having its own time limiting contact; and

a fermenting control circuit coupled at least to said exclusive time setter and being responsive to operation of said exclusive time setter and kneading switch to turn both of the fermenting heaters ON to cause the interior of the vessel and oven chamber to be heated to a temperature set by the thermoswitch over a time period set by the exclusive time setter.

4,202,259

CONVECTION OVEN

Leif A. T. Johansson, Huddinge, Sweden, assignor to Tipe Revent AB, Stockholm, Sweden

Filed Nov. 7, 1978, Ser. No. 958,331

Claims priority, application Sweden, Nov. 29, 1977, 7713504

Int. Cl.[2] A47J *37/00*

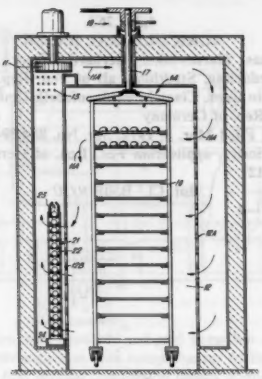
U.S. Cl. 99—352 **10 Claims**

1. A convection oven, comprising:

(a) means defining an oven chamber receptive of a load as a batch;

(b) means for circulating heated air in a closed path extending substantially horizontally through said oven chamber;

(c) a multiplicity of blocks disposed outside said oven chamber in a substantially vertical plane in said closed path, said plane being transverse to the direction of the air flow



through said oven chamber, the material of said blocks having a high thermal conductivity; and

(d) means for spreading water over said blocks only at the start of a baking cycle;

whereby during the remainder of the cycle said air flow effects reheating of the blocks for use with the next batch by direct engagement of said air flow with said blocks.

4,202,260

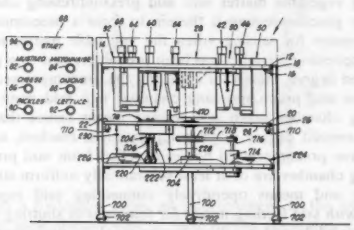
AUTOMATIC SANDWICH MAKING APPARATUS

Arland D. Weger, Box 382, Colbert, Okla. 74733

Filed Aug. 24, 1978, Ser. No. 936,647

Int. Cl.[2] **A21C** *9/04*; **B32B** *31/04*

U.S. Cl. 99—450.4 **30 Claims**



1. An apparatus for making sandwiches consisting of an upper breadpiece and a lower breadpiece and foodstuff disposed between the upper and lower breadpieces, comprising:

an upper support;

a lower support disposed near and spaced a distance from the upper support, the lower support having a sandwich station thereon;

a lower breadpiece dispenser connected to the upper support and having a portion for retaining lower breadpieces and a dispensing passageway formed through a portion thereof, a lower breadpiece being dispensable from the lower breadpiece dispenser;

a foodstuff dispenser connected to the upper support and spaced a distance from the lower breadpiece dispenser, having a portion for retaining foodstuff, the foodstuff being dispensable from the foodstuff dispenser;

an upper breadpiece dispenser connected to the upper support and spaced a distance from the foodstuff dispenser, having a portion for retaining upper breadpieces and a dispensing passageway formed through a portion thereof, an upper breadpiece being dispensable from the upper breadpiece dispenser;

a discharge assembly for moving the sandwich disposed on the sandwich station to a sandwich discharge position in a discharge station of the upper and the lower supports;

means for moving one of the upper support and the lower support to a lower breadpiece dispensing station and the lower breadpiece dispenser being disposed in a predetermined position relative to the sandwich station on the lower support in the lower breadpiece dispensing station for receiving a lower breadpiece dispensed from the lower breadpiece dispenser, and for moving one of the upper support and the lower support to a foodstuff dispensing station and the foodstuff dispenser being disposed in a predetermined position relative to the sandwich station on the lower support in the foodstuff dispensing station for dispensing the foodstuff from the foodstuff dispenser on a sandwich portion disposed on the sandwich station in the foodstuff dispensing station, and for moving one of the upper support and the lower support to an upper breadpiece dispensing station and the upper bread dispenser being disposed in a predetermined position relative to the sandwich station on the lower support in the upper breadpiece dispensing station for dispensing an upper breadpiece on a sandwich portion disposed on the sandwich station in the upper breadpiece dispensing station, and for moving one of the upper support and the lower support to the discharge station and the discharge assembly being disposed in a predetermined position relative to the sandwich station on the lower support in the discharge station for discharging a sandwich disposed on the sandwich station to the sandwich discharge position;

means for dispensing foodstuff from the foodstuff dispenser onto the sandwich portion disposed on the sandwich station in the foodstuff dispensing station of the upper and the lower supports; and

means for dispensing one of the upper and the lower breadpieces from the upper and the lower breadpiece dispensers onto the sandwich station, comprising:

means for dispensing one of the lower and upper breadpieces from the lower and upper breadpiece dispensers, comprising:

a pin member having opposite ends and extending through the lower support generally near the sandwich station, the pin member being movable to a dispensing position wherein a portion of the pin member generally near one end thereof extends into the dispensing passageway formed in the upper and the lower breadpiece dispensers, the pin member engaging one of the lower breadpieces in the lower breadpiece dispenser and moving the engaged lower breadpiece from the lower breadpiece dispenser onto the sandwich station as the sandwich station moves through the lower breadpiece dispensing station and the pin member engaging one of the upper breadpieces in the upper breadpiece dispenser and moving the engaged upper breadpiece from the upper breadpiece dispenser onto the sandwich station as the sandwich station moves through the upper breadpiece dispensing station;

a cam roller journally connected to the end of the pin member generally opposite the end portion of the pin member engagable with the lower breadpiece; and

a cam surface spaced a distance from the lower support for positioning the pin member, the cam roller rollingly engaging the cam surface during the movement of one of the upper and the lower supports, the cam surface being positioned to move the pin member to

the dispensing position via the engagement between the cam roller and the cam surface in the lower breadpiece dispensing station of the upper and the lower supports and the cam surface being positioned to move the pin to the dispensing position via the engagement between the cam roller and the cam surface in the upper breadpiece dispensing station of the upper and the lower supports.

4,202,261

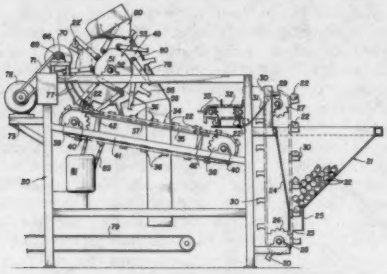
METHOD AND APPARATUS FOR TRIMMING ONIONS OR LIKE PRODUCE

William J. Lawson, Milton, Del., assignor to Magnuson Engineers, Inc., San Jose, Calif.

Filed Mar. 14, 1978, Ser. No. 886,470

Int. Cl.[2] A23N *15/08*

U.S. Cl. 99—636 **1 Claim**



1. A machine for trimming onions or like produce comprising:

a storage receptacle to receive onions;

means to convey onions one at a time from said storage receptacle;

an orientation device positioned to receive the onions from said convey means, said orientation device comprising:

a fixed inclined plate for receiving the onions; and

spaced pocket pusher elements and means for moving the elements up the inclined plate in succession, each element comprising a pair of planar flight sections positioned end-to-end across said plate with adjacent ends spaced apart and extending away from the direction of travel to form a V-configured pusher element to receive and cause an onion to roll upwardly on said plate and thereby orient the stem axis across the plate while centering the onion relative to the flight sections;

a trimming station comprising a pair of laterally spaced trimming blades for engaging an onion moving therebetween to trim protrusions from opposite ends thereof;

means to grip and pick up each onion from the pusher element comprising,

a vertically disposed rotating disc supported for rotation about a horizontal axis;

a plurality of circumferentially spaced rigidly mounted first gripping jaws supported on and extending radially from said disc;

a second gripping jaw for each rigidly mounted gripping jaw mounted on the disc for pivoting towards and away from said corresponding rigid gripping jaw and thereby form pairs of gripping jaws;

spring means for biasing each second gripping jaw towards the corresponding rigid gripping jaw;

a profiled cam fixed to said disc and positioned to engage said second gripping jaws in succession and cyclically cause said second jaws to close towards the corresponding rigid jaw of the pair and remain closed at a position to hold an onion therebetween;

means supporting and rotating said disc for first swinging the pairs of gripping jaws through the center of the space between a pair of flight sections while each second jaw is being moved towards the corresponding first jaw to grip the oriented onion and carry it between the trimming blades to trim the protrusions therefrom; and

said cam thereafter acting to move the second jaw from the first jaw to release the trimmed onion.

4,202,262

AGRICULTURAL BALER

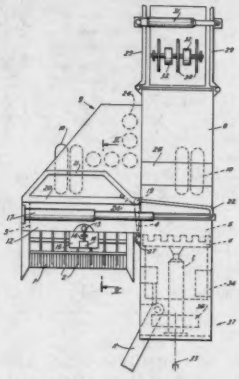
Helmut Claas, Harsewinkel; Gerhard Römer, Detmold, and Otger Weddeling, Stadtlohn, all of Fed. Rep. of Germany, assignors to Gebr. Claas Maschinenfabrik GmbH, Harsewinkel, Fed. Rep. of Germany

Filed Mar. 8, 1978, Ser. No. 884,594

Claims priority, application Fed. Rep. of Germany, Oct. 3, 1977, 2710412

Int. Cl.[2] B30B *9/30*

U.S. Cl. 100—4 **12 Claims**



1. An agricultural baler for baling of vegetable matter, comprising means forming a precompressing chamber and a main compressing chamber communicating therewith; means for feeding vegetable matter into said precompressing chamber and for precompressing it therein to form a precompressed body; means for sensing when the vegetable matter in said precompressing chamber has been precompressed to a predetermined degree; means for expelling the precompressed bodies from said precompressing chamber into said main compressing chamber when said sensing means senses that said predetermined degree of precompression is reached, so that successive precompressed bodies expelled from said precompressing chamber are of at least substantially uniform size and density; and means operatively connecting said expelling means with said feeding means for temporarily shutting down the latter while said expelling means expel the precompressed bodies from said precompressing chamber into said main compressing chamber.

4,202,263

SCRAP SHEARING MACHINES

Heinrich Schulte, Witten-Herbede, Fed. Rep. of Germany, assignor to Lindemann Maschinenfabrik GmbH, Düsseldorf, Fed. Rep. of Germany

Filed Jun. 8, 1978, Ser. No. 913,543

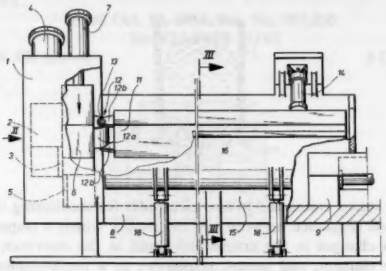
Claims priority, application Fed. Rep. of Germany, Jun. 18, 1977, 2727436

Int. Cl.[2] B30B *9/32*

U.S. Cl. 100—95 **7 Claims**

1. A scrap shearer comprising a shear frame, a pair of relatively movable shearing blades mounted in said shear frame, a

crusher mounted in said shear frame upstream of said shearing blades, a filling trough upstream of said shear frame, a feed device for feeding scrap along said trough towards said crusher, a press bar for precompacting said scrap in said trough to a predetermined size to enable said crusher and said shearing blades to accommodate said scrap, and a force transferring connection between said shear frame and said filling trough whereby said shear frame reinforces said filling trough, said



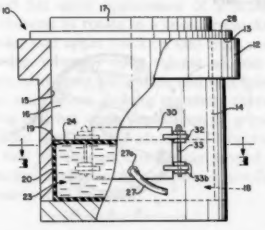
shearing blades, said crusher, and said press bar all being located in a common plane, said scrap shearer further including an end plate, first pivotal connection means connecting a first side of said end plate to said crusher, second pivotal connection means connecting a second side of said end plate to said press bar, said first side of said end plate being opposite said second side, and a ram arranged and acting between said second connection means and said shear frame.

4,202,264

STRUCTURE FOR HYDRAULIC POWER APPARATUS

John M. Hausman, 2669 Wilbur Rd., Medina, Ohio 44256

Filed Feb. 5, 1979, Ser. No. 9,345
Int. Cl.[2] B30B *1/32*
U.S. Cl. 100—269 A **9 Claims**



1. In a hydraulic press, an improvement to the hydraulic power apparatus, devoid of fluid-sealing apparatus, comprising:

a ram pot, a ram, and an inflatable resilient pressure container;

said ram pot having smooth walled interior surfaces, said ram having smooth walled exterior surfaces and a bottom surface, said ram and said inflatable pressure container residing within said smooth walled interior surfaces of said ram pot, and restraining means for separating said ram and said inflatable pressure container when pressure is released from said container;

said ram pot having a shell including a container installation aperture and a container installation hatch positioned in said aperture and forming an operative portion of said smooth walled interior surfaces; and,

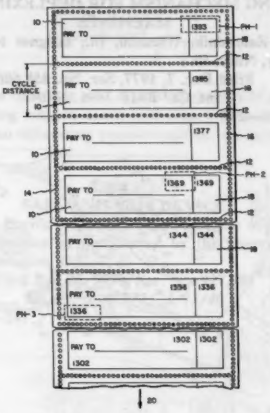
said inflatable pressure container having a feed line attached thereto and having fluid contained therein.

4,202,265

CONTROLLING THE OPERATION OF NUMBERING MACHINES

Ira Eglowstein, 47 Chaumont Dr., Williamsville, N.Y. 14221, and Peter E. Solender, Williamsville, N.Y., assignors to Ira Eglowstein, Williamsville, N.Y.

Filed Jan. 24, 1978, Ser. No. 871,778
Int. Cl.[2] B41L *49/02*
U.S. Cl. 101—72 **7 Claims**



1. In printing apparatus for printing a plurality of associated identification numbers and check digits on each of a succession of documents where the identification numbers and associated check digits on the same document are all alike but the associated identification numbers and check digits are changed on successive documents, said apparatus having a plurality of numbering devices which are simultaneously cyclically driven synchronously with the feeding of said documents into registration with said devices for printing said identification numbers, and a plurality of number printers each separately associated with a different one of said numbering devices for printing the check digits for the identification numbers associated therewith, a control system for said apparatus which enables the associated identification number numbering devices and check digit number printers to print on different ones of said successive documents, said control system comprising

means driven cyclically with different ones of said identification number numbering devices for providing a plurality of first timing signals each corresponding to a different one of said identification number numbering devices and synchronously with the printing of each of said successive identification numbers,

means for selecting one of said first timing signals as a lead timing signal,

means interfacing with a source of data words each of which data words represents a successive one of said check digits for storing a plurality of said data words in succession,

a plurality of channels each corresponding to a different one of said check digit number printers, each of said channels having a separate shift register for said data words in which said data words are stored in successive stages, and a control means for translating said data words into a signal for operating said check digit number printer corresponding to said channel to present for printing check digits represented by said data words,

means operated by said lead timing signal for reading out one at a time data words from said interfacing means simultaneously into all of said shift registers in said plurality of channels and advancing said registers to shift said data words to the next successive stages therein,

addressing means for reading out the words stored in se-

lected stages of said registers in different ones of said channels to said control means thereof, and

means for enabling each of said control means separately with the one of said first timing signals corresponding to the one of said identification number numbering devices associated with the check digit number printer operated by the one of said control means which is enabled.

4,202,266

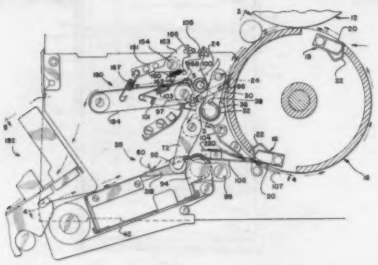
STAGING MECHANISM FOR DUPLEXING COPY MACHINES

George J. Zahradnik, Wheaton, Ill., assignor to A. B. Dick Company, Niles, Ill.

Filed Dec. 7, 1977, Ser. No. 858,606

Int. Cl.[2] **B41F** *7/06, 21/04*

U.S. Cl. 101—218 **17 Claims**



1. In an offset duplicator including a surface for receiving images transferrable to copy sheets, a carrier, drive means for moving the surface and carrier in unison, means for feeding the copy sheets between the surface and carrier, first and second grippers associated with the carrier for gripping edges of said sheets and for holding the sheets on the carrier, said feeding means feeding each sheet to the first gripper whereby the leading edge of each sheet is engaged by the first gripper for movement between the surface and carrier and for transfer of a first image to one side of each sheet, means for releasing said sheet from said first gripper, and means for re-feeding said sheets, trailing edge first, to said second gripper for movement again between said surface and carrier, and for transfer of a second image to the opposite side of each sheet, the improvement in said re-feeding means comprising a conveyor bed, conveyor means movable over said bed, and drive means for said conveyor means for directing said sheets along said bed in a direction away from said carrier and for reversing the direction of movement of said sheets back toward said carrier, said drive means for said conveyor means including camming means imparting reciprocating movement to said conveyor means, a shaft for supporting said camming means, a coaxially mounted shaft, additional camming means on said coaxially mounted shaft for controlling said feeding means for feeding each sheet to the first gripper, and means for adjusting said first mentioned shaft and said coaxially mounted shaft relative to each other.

4,202,267

DEVICE FOR MONITORING THE INK SUPPLY IN INK-OPERATED PRINTERS

Joachim Heinzl; Hans Kern, and Fritz Giebler, all of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

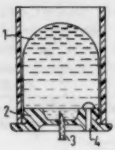
Filed Apr. 21, 1977, Ser. No. 789,743

Claims priority, application Fed. Rep. of Germany, Apr. 23, 1976, 2617730

Int. Cl.[2] **B41F** *33/12, 33/02;* **G01F** *23/26*

U.S. Cl. 101—364 **15 Claims**

1. A device for monitoring the supply of electrically conductive printing liquid of an associated ink-operated printer, comprising a reservoir having an outlet at the bottom thereof for printing liquid, two monitoring electrodes positioned at the bottom portion of said reservoir and disposed in and wetted by the printing liquid, one of said electrodes being disposed in the reservoir bottom in the vicinity of said outlet, the other of said electrodes being so disposed with respect to the first electrode that the gap therebetween, normally filled by printing liquid, extends generally laterally along the bottom of said reservoir,



circuit means connected to said electrodes for monitoring the electrical resistance between said electrodes, which is responsive to changes in the amount of liquid in the reservoir, a display element, and means, responsive to a predetermined resistance value, cooperable with means for effecting disconnection of said associated ink-operated printer and actuation of said display element.

4,202,268

TRANSFER DRUM FOR PRINTING PRESSES WITH DEVICES FOR GRIPPING THE LEADING AND TRAILING EDGES OF A SHEET WHICH IS BEING IMPRINTED

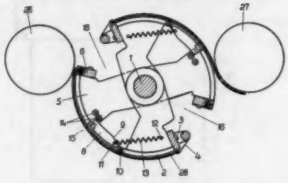
Willi Becker, Bammental, Fed. Rep. of Germany, assignor to Heidelberger Druckmaschinen Aktiengesellschaft, Heidelberg, Fed. Rep. of Germany

Continuation of Ser. No. 525,612, Nov. 20, 1974, abandoned. This application Jun. 25, 1976, Ser. No. 699,845

Claims priority, application Fed. Rep. of Germany, Nov. 22, 1973, 2358223

Int. Cl.[2] **B41F** *13/44, 21/04*

U.S. Cl. 101—409 **9 Claims**



1. Transfer drum for printing presses through which a sheet to be imprinted passes, comprising a shaft for rotatably mounting the transfer drum, a first and a second row of sheet-supporting elements disposed in comb-like fashion along the periphery of the drum, devices for gripping, respectively, the trailing and leading edges of a sheet, one of said rows of sheet-supporting elements being rotatably mounted directly on said shaft together with one of said gripping devices, and the other of said rows of sheet-supporting elements together with the other of said gripping devices being fixedly mounted directly on said shaft, said row of sheet-supporting elements together with said gripping devices, respectively, being rotatable as respective units relative to one another, each of said gripping devices comprising a gripper bar rigidly extending with a continuous sheet-supporting surface over substantially the entire width of the drum and being secured to each of the sheet-supporting elements of the respective row thereof in channels formed in said drum, said gripping devices being

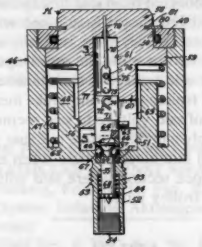
stationary at all times relative to the respective row of sheet-supporting elements.

4,202,269

FUZE MINE ANTI-PERSONNEL

Joseph R. Messineo, Paterson, and George F. Lehwald, South Orange, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 15, 1958, Ser. No. 767,490
Int. Cl.[2] F42B *23/10*
U.S. Cl. 102—8 **3 Claims**



2. In an anti-personnel mine fuze, a body member having a cylindrical recess therein, an upstanding concentrical sleeve in said recess, a spring-loaded pressure plate slidable in said body and sleeve, firing mechanism for said fuze comprising a firing pin release having a socket in its lower portion and a cut away upper portion defining a planar vertical face, a track member secured to said planar face defining a pair of downwardly inclining parallel upper and lower tracks, a spring loaded firing pin slidable in said body and received in said socket in said firing pin release, detent means normally locking said firing pin in said socket, a spring held selector bar pivotally mounted in said pressure plate member and disposed normally above said track member and a pin fixed with the lower end of said bar adapted upon downward movement of said pressure plate member and said bar upon application of a predetermined personnel load thereon to rotate in a counter-clockwise manner and snap under said upper track on said track member in a clockwise direction whereby upon release of said personnel load on said plate, said firing pin release and said firing pin will be lifted to free said detent locking members therefrom and release said firing pin, but upon application of a load heavier than said personnel load on said plate, said selector bar will rotate to move said pin thereon completely around said track member in a clockwise manner to complete a non-functioning cycle and rearmament of said fuze.

4,202,270

STUB CASE OBTURATOR

Hans W. Luther, Kaarst, and Hartmut Marwitz, Duesseldorf, both of Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Duesseldorf, Fed. Rep. of Germany

Filed Feb. 9, 1978, Ser. No. 876,201
Claims priority, application Fed. Rep. of Germany, Feb. 9, 1977, 2705278
Int. Cl.[2] F42B *9/26*; B23P *11/00*
U.S. Cl. 102—43 R **10 Claims**

1. A stub case which performs an obturating function on the barrel wall of a firearm, which comprises:

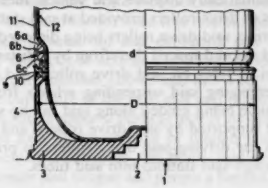
(a) a base;

(b) an annular wall extending from the perimeter of the base;

(c) means for throttling the streams of gas produced by detonation which flow back between the stub case and barrel wall;

(d) means for permitting said streams of gas to expand, depending from said throttling means;

(e) a packing ring fitted around the annular wall of the stub case; and



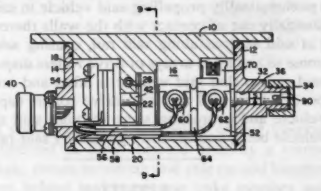
(f) means for directing said expanded streams of gas against the packing ring to cause said ring to expand so as to produce an obturating pressure against the barrel wall.

4,202,271

SAFE AND ARM DEVICE

John H. Day, Pacific Palisades, Calif., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 25, 1978, Ser. No. 927,781
Int. Cl.[2] F42C *15/24, 15/40*
U.S. Cl. 102—247 **7 Claims**



1. A safe and arming device comprising a housing having an unbalanced rotor rotatably mounted by a rotor shaft in said housing; said shaft having spring biasing means biasing said rotor to a safe position, said rotor being unbalanced and rotatable to an arming position; latching means pivotably mounted in said housing and engaging said rotor when said rotor has been rotated to said arming position for latching said rotor in said arming position; and resafe means mounted in said housing and engageable with said latching means for rotating said latching means away from said rotor to unlatch said rotor and allow said spring means to bias said rotor into said safe position.

4,202,272

PNEUMATIC TRANSPORT APPARATUS AND METHOD OF PROPULSION

Constantin Teodorescu; Constantin Ceauselu, and Stefan Ardeleanu, all of Bucharest, Romania, assignors to Institutul National Pentru Creatie Stiintifica Si Tehnica, Bucharest, Romania

Filed Jun. 30, 1977, Ser. No. 811,679
Claims priority, application Romania, Jul. 14, 1976, 86971
Int. Cl.[2] B61B *1/00, 3/00, 13/10, 13/12*
U.S. Cl. 104—91 **3 Claims**

1. A pneumatic transport system comprising:

a continuous profiled overhead rail defining a vehicle path extending over a plurality of entrainment stations;

a plurality of pneumatic transport tubes enclosing said rail at spaced intervals therealong between said entrainment stations;

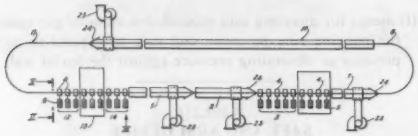
at least one vehicle suspended from said rail and displaceable therealong, said vehicle being dimensions to pass through said tubes generally spaced therefrom and provided with

suspending wheels rollingly supported upon said rail and lateral guide wheels flanking said rail;

means for generating a reduced pressure in said tubes to pneumatically displace said vehicle therethrough;

arrays of drive rollers provided at said stations and adjacent thereto, said drive rollers being disposed directly beneath said rail and spaced therefrom by a distance such that said vehicle rides on said drive rollers and is lifted thereby, disengaging said suspending wheels from said rail, said vehicle being guided along said rail by said guide wheels and supported by said drive rollers; and

means for driving said drive rollers to propel said vehicle through said stations into said tubes.



3. A method of operating a pneumatic transport system in which a vehicle suspended from an overhead rail is displaced and guided therealong through a plurality of entrainment stations and spaced-apart transport tubes disposed between said stations, said method comprising the steps of:

(a) pneumatically propelling said vehicle in said tubes substantially out of contact with the walls thereof; and

(b) at said stations along said rail, causing said vehicle to come to rest upon arrays of drive rollers disposed beneath said rail so that said vehicle is lifted and no longer suspended from said rail, said drive rollers supporting said vehicle and propelling same through said stations, said vehicle being continuously guided by said rail.

4,202,273

TRAVELLING OBJECT CONTROL SYSTEM UTILIZING POWER CONTROL

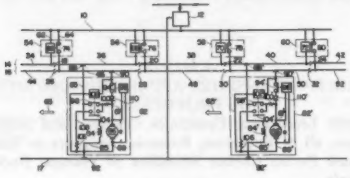
Kazumi Matsui, Yokohama; Takashi Takasue, Kawaguchi, and Masami Iwasaki, Tokyo, all of Japan, assignors to The Furukawa Electric Co., Ltd., Tokyo, Japan

Filed Sep. 9, 1977, Ser. No. 832,066

Claims priority, application Japan, Sep. 13, 1976, 51-108900; Nov. 2, 1976, 51-131284; May 10, 1977, 52-52685; May 10, 1977, 52-52686

Int. Cl.[2] B60M *1/10*

U.S. Cl. 104—298 **8 Claims**



1. An improved control system apparatus for controlling the operation of travelling objects through the power control of DC constant voltage feeding, employing feeding means disposed along a track for applying a DC constant voltage to first and second trolley wires, said first trolley wire having a plurality of means for insulating and sectioning disposed at intervals along a predetermined block section, being adapted to maintain continuous constant voltage feed, said second trolley wire having a plurality of insulating and sectioning means disposed at intervals along said predetermined block section, being responsive to feeding control by on-off switch means for control of the constant voltage feeding, and a negative feeder line consisting of a trolley wire; said improvement comprising: providing section control means for each of said block sections defined by said means for insulating and sectionalizing said first and second trolley wires respectively, to connect said feeding means to a section of said first trolley wire and to a section of said second trolley wire defined by the block section behind said first trolley wire section, said section control means being adapted to apply said voltage to said first trolley wire section in a direction of movement of travelling objects in the presence of an object load on said first trolley wire section to thereby block the blocking section with which said trolley wire section is associated; and DC motor means disposed on each of said travelling objects to impart motion thereto, by collecting power from said trolley wires, said DC motor means is supplied with current collected from said first trolley wire, and an armature coil of said DC motor is supplied with power collected from said second trolley wire, whereby each travelling object is caused to have a constant speed operation in that block section where said voltage is simultaneously applied to said first and second trolley wires, and brake means for detecting non-application of said voltage to said second trolley wire being adapted to apply a braking force to cause said travelling object to stop within said block section, when each travelling object enters that block section where said voltage is not applied to said second trolley wire.

4,202,274

REMOVAL APPARATUS FOR HANDLING DISCARDED END PORTIONS IN A MULTISTRAND CASTING PLANT

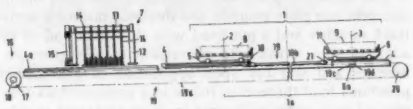
Siegfried Dangeleit, Krefeld, and Dieter Kothe, Moers, both of Fed. Rep. of Germany, assignors to DEMAG Aktiengesellschaft, Duisburg, Fed. Rep. of Germany

Filed Aug. 15, 1977, Ser. No. 824,258

Claims priority, application Fed. Rep. of Germany, Aug. 18, 1976, 2637072

Int. Cl.[2] B61B *13/12*

U.S. Cl. 104—165 **7 Claims**



1. In apparatus for removing unwanted cut ends of the cast strands in a multi-strand casting plant, and having

(a) a plurality of cast strand paths;

(b) a wheeled vehicle in each cast strand path for receiving said cut ends;

(c) each said vehicle having a bearing surface positioned in its respective strand path downstream of cutters for receiving the cut ends, dropped from the strand path with each said bearing surface below the bottom edge of the strand path;

(d) a single discharge station positioned at one side of said bearing surfaces;

(e) a dual rail connecting said strand paths with said discharge station, said dual rail extending transversely of said strand paths; the improvement characterized by

(f) said dual rail being a single rail path;

(g) said wheeled vehicles positioned in said single rail path, with one vehicle for each strand path;

(h) a single power means in said rail path;

(i) said single power means connected to only one of said vehicles;

(j) said power connected vehicle pulling said other vehicles in one direction of travel on said rail;

(k) tractive connection means connecting said power connected vehicle with said other vehicles;

(l) said tractive connection means including

(1) a tie rod,

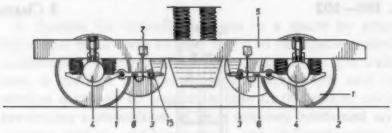
(2) each said tie rod pivotally connected at one end to one of said vehicles,
(3) each said tie rod is of a length to maintain said spacing distance as measured between the center of adjacent strand paths,
(4) each said tie rod and the adjacent connected vehicle having a clutch connection at the end thereof opposite said pivot connection, and
(5) each clutch connection allowing spacing between said vehicles in the pull direction equal to the distance between the center of adjacent strand paths, and in the push direction at a distance shorter than said spacing;
(m) said clutch connection comprising
(1) a hooked tie rod head at the end of said tie rod,
(2) a slotted guide on said adjacent vehicle for receiving said tie rod in sliding engagement, and
(3) each said slotted guide having cooperating means for engagement with said hooked tie rod head in said pulling direction of said power connected vehicle.

4,202,275

DEVICE FOR PROTECTING SELF-PROPELLED RAIL VEHICLES AGAINST SWAYING

Friedhelm Bitterberg, Fuldatal II, Fed. Rep. of Germany, assignor to Thyssen Industrie Aktiengesellshaft, Essen, Fed. Rep. of Germany

Filed Sep. 6, 1977, Ser. No. 830,462
Claims priority, application Fed. Rep. of Germany, Sep. 3, 1976, 2639737
Int. Cl.[2] G08B *21/00*
U.S. Cl. 105—61 **3 Claims**



1. A device for protecting self-propelled rail vehicles against swaying. which comprises in combination a measuring unit for ascertaining the torsional vibrations of the wheels of a driving wheel set with regard to each other, characterized in that between the wheel set bearings and the carriage frame in the longitudinal direction of the vehicle there is connected a reaction guide rod support and a measuring unit thereon immediately responsive to the torsional vibration reactions detected early in time below limit of slippage between the wheel set bearings and the carriage frame, and means to produce a corresponding control signal in response to said torsional vibration to the drive motor and thus control of the pulling force of the wheel set is adapted to be initiated for operation and travel in a safe range as to swaying and torsional vibrations.

4,202,276

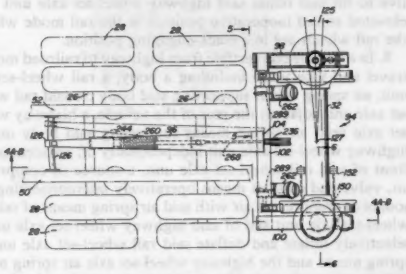
SELF-STEERING WHEEL-SET FOR CONVERTIBLE RAILWAY VEHICLE

Kenneth A. Browne, Lexington; Alan R. Cripe, Richmond, both of Va., and Eugene Hindin, Bala Cynwyd, Pa., assignors to Bi-Modal Corporation, Greenwich, Conn.

Division of Ser. No. 810,120, Jun. 27, 1977. This application Aug. 28, 1978, Ser. No. 937,145
Int. Cl.[2] B60F *1/04;* B61D *15/00;* B61F *5/36;* B62D *61/12*
U.S. Cl. 105—165 **9 Claims**

1. In a railway vehicle, longitudinal transversely spaced members secured therebeneath, an arcuate member joining them at a predetermined location and a rail wheel-set axle unit comprising a yoke including transversely spaced longitudinal members connected at their forward ends by a transverse member, an axle, means mounting said axle on said longitudinal yoke members behind said transverse yoke member and extending substantially parallel thereto, railway wheels mounted on said axles, air spring means supporting said vehicle on said rail wheelset axle unit, a longitudinal tongue fixedly secured at its rear end to said transverse yoke member substantially centrally thereof and means at the forward free end of said tongue slidably mounting the same on and capturing said arcuate member whereby said tongue acts as a tow bar, its slide connection to said arcuate member allows said rail wheel-set axle unit to follow the curvature of the rails and said rail wheel-set axle unit is free to rotate about a vertical axis at its center and said rail wheel-set axle unit is capable of limited lateral and longitudinal movement relative to the body, said air spring means acting to center said tongue and permit a limited amount of lateral and longitudinal movement.

7. In a railway vehicle, longitudinal transversely spaced members secured therebeneath, an arcuate member joining them at a predetermined location and a rail wheel-set axle unit



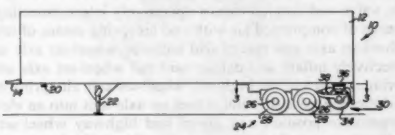
comprising a yoke including transversely spaced longitudinal members connected at their forward ends by a transverse member, an axle, means mounting said axle on said longitudinal yoke members behind said transverse yoke member and extending substantially parallel thereto, railway wheels mounted on said axles, means resiliently supporting said vehicle on said rail wheel-set axle unit permitting a limited amount of lateral and longitudinal movement, a longitudinal tongue fixedly secured at its rear end to said transverse yoke member substantially centrally thereof and means at the forward free end of said tongue slidably mounting the same on and capturing said arcuate member whereby said tongue acts as a tow bar, its slide connection to said arcuate member allows said rail wheel-set axle unit to follow the curvature of the rails, and said rail wheel-set axle unit is free to rotate about a vertical axis at its center and is capable of limited lateral and longitudinal movement relative to the body.

4,202,277

CONVERTIBLE RAIL-HIGHWAY SEMI-TRAILER

Kenneth A. Browne, Lexington; Alan R. Cripe, Richmond, both of Va., and Eugene Hindin, Valley Forge, Pa., assignors to Bi-Modal Corporation, Greenwich, Conn.

Filed Jun. 27, 1977, Ser. No. 810,120
Int. Cl.[2] B60F *1/04;* B61D *17/10;* B61H *1/00;* B62D *61/12*
U.S. Cl. 105—215 C **18 Claims**



1. In a vehicle convertible from highway to railroad mode of travel and vice versa including a body; a rail wheel-set axle unit, air spring means supporting said body on said rail wheel-

set axle unit adjacent the rear of the vehicle, a highway wheel-set axle unit, air spring means supporting said body on said highway wheel-set axle unit independently of, adjacent and in front of said rail wheel-set axle unit, a source of compressed air, valve and conduit means operatively interconnecting said source of compressed air with said air spring means of said rail wheel-set axle unit and of said highway wheel-set axle unit to selectively inflate and deflate said rail wheel-set axle unit air spring means and the highway wheel-set axle air spring means and thereby raise said rail wheel-set axle unit into an elevated inoperative position and lower said highway wheel-set axle unit into a ground-engaging position for the highway mode of travel and vice versa, means interconnecting said body and said rail wheel-set axle unit operative to lift and retain said rail wheel-set axle unit to its elevated stored inoperative position in the highway mode, and means interconnecting said body and said highway wheel-set axle unit independently of said body and rail wheel-set axle unit interconnecting means and operative to lift and retain said highway wheel-set axle unit to its elevated stored inoperative position in the rail mode wherein the rail wheels are in a track-engaging position.

9. In a vehicle convertible from highway to railroad mode of travel and vice versa including a body; a rail wheel-set axle unit, air spring means supporting said body on said rail wheel-set axle unit adjacent the rear of the vehicle, a highway wheel-set axle unit, air spring means supporting said body on said highway wheel-set axle unit independently of, adjacent and in front of said rail wheel-set axle unit, a source of compressed air, valve and conduit means operatively interconnecting said source of compressed air with said air spring means of said rail wheel-set axle unit and of said highway wheel-set axle unit to selectively inflate and deflate said rail wheel-set axle unit air spring means and the highway wheel-set axle air spring means and thereby raise said rail wheel-set axle unit into an elevated inoperative position and lower said highway wheel-set axle unit into a ground-engaging position for the highway mode of travel and vice versa, means interconnecting said body and said rail wheel-set axle unit operative to lift and retain said rail wheel-set axle unit to its elevated stored inoperative position in the highway mode, and means interconnecting said body and said highway wheel-set axle unit independently of said body and rail wheel-set unit interconnecting means and operative to lift and retain said highway wheel-set axle unit to its elevated stored inoperative position in the rail mode wherein the rail wheels are in a track-engaging position, wherein said vehicle includes longitudinal side rails, a pair of spaced longitudinal channels at the rear portion of the vehicle, a kingpin supporting member at the front of the vehicle secured to said rails including a plate, a further plate mounted on said channels and secured to said side rails, floor boards extending the full length of the vehicle, cross members secured to said side rails, adhesive means securing said floor boards on said plates and a plurality of screws additionally securing said floor boards on said plates and on said cross members connected to said rails to transmit a substantial portion of the buff and draft loads to the vehicle.

10. In a vehicle convertible from highway to railroad mode of travel and vice versa including a body; a rail wheel-set axle unit, air spring means supporting said body on said rail wheel-set axle unit adjacent the rear of the vehicle, a highway wheel-set axle unit, air spring means supporting said body on said highway wheel-set axle unit independently of, adjacent and in front of said rail wheel-set axle unit, a source of compressed air, valve and conduit means operatively interconnecting said source of compressed air with said air spring means of said rail wheel-set axle unit and of said highway wheel-set axle unit to selectively inflate and deflate said rail wheel-set axle unit air spring means and the highway wheel-set axle air spring means and thereby raise said rail wheel-set axle unit into an elevated inoperative position and lower said highway wheel-set axle unit into a ground-engaging position for the highway mode of travel and vice versa, means interconnecting said body and said rail wheel-set axle unit operative to lift and retain said rail wheel-set axle unit to its elevated stored inoperative position in the highway mode, and means interconnecting said body and said highway wheel-set axle unit independently of said body and rail wheel-set unit interconnecting means and operative to lift and retain said highway wheel-set axle unit to its elevated stored inoperative position in the rail mode wherein the rail wheels are in a track-engaging position, wherein said body includes transversely spaced longitudinal channels secured therebeneath on both sides of the longitudinal center of the vehicle and an arcuate member joining them at a predetermined location, said rail wheel-set axle unit comprising a yoke including transversely spaced longitudinal members connected at their forward ends by a transverse member, an axle, means mounting said axle on said longitudinal yoke members behind said transverse yoke member and extending substantially parallel thereto, railway wheels mounted on said axle a longitudinal tongue fixedly secured at its rear end to said transverse yoke member substantially centrally thereof and means at the forward free end of said tongue slidably mounting the same on and capturing said arcuate member whereby said tongue acts as a tow bar, its slide connection to said arcuate member allows the rail wheel-set axle unit to follow the curvature of the rails and said rail wheel-set axle unit is free to rotate about a vertical axis at its center and said rail wheel-set axle unit is capable of limited lateral and longitudinal movement relative to the body.

4,202,278

MOVABLE DISTRIBUTION CONTAINER

Gustav Wadenhed, Helsingborg, Sweden, assignor to Tradgardshallen i Helsingborg Planteringsvagen, Helsingborg, Sweden

Filed Feb. 21, 1978, Ser. No. 879,389
Claims priority, application Sweden, Feb. 23, 1977, 7702017
Int. Cl.[2] **A47B** *11/00;* **A47F** *5/10*
U.S. Cl. 108—102 **8 Claims**

1. A movable distribution container comprising a frame of generally right-angled parallelepipedic shape and a plurality of juxtaposed shelves supported by said frame, said frame comprising:

four vertically-extending members defining vertical corners of said frame;

first means for interconnecting two adjacent members to form a first side of said frame;

second means for interconnecting the other two members to form a second side of said frame;

third means for interconnecting said sides of said frame, said third means being adjustable to vary the distance between said first and said second sides; and

a plurality of wheels forming part of and supporting each side of said frame;

one of said shelves comprising:

first and second horizontally-extending members connected at substantially the same heights to said first and said second sides of said frame, respectively; and

a first and a second series of members having distal ends connected to said first and said second horizontally-extending members, respectively, said series of mem-

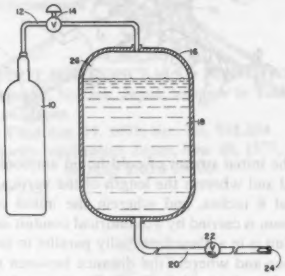
bers having inwardly-facing proximal ends that form a support surface, with the members of the series being interdigitally alternately spaced, the width of the support surface being changed when said third means is adjusted to vary the distance between said first and said second sides.

4,202,279

STICKY FOAM

Peter B. Rand, Albuquerque, N. Mex., assignor to The Unites States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 12, 1977, Ser. No. 832,488
Int. Cl.[2] E05G 5/02; G08B 15/00, 15/02
U.S. Cl. 109—34 **8 Claims**



1. System for impeding access to a space by attack with individual hand tools to gain entry to the space comprising in combination a reservoir portion containing a gas under pressure, a conduit portion communicating with said reservoir portion disposed to impede access to the space, sticky foam generating composition of high tenacity contained within the conduit portion, said reservoir and communicating conduit portion together forming a closed system with impervious walls normally maintaining said composition in substantially liquid condition under pressure, the tenacious sticky foam generating composition contained within the conduit comprising a tacky polymeric resin intermixed with a low boiling solvent and under pressure of said gas, rupture of a wall portion of said system effecting rapid exuding of composition through said rupture and formation of a sticky hand-tool-engulfing foam of high tenacity.

4,202,280

FURNACE FLUE APPARATUS FOR IMPROVED FLY ASH SEPARATION

Rolf Bereiter, Hinteregg, and Alexander Jachimowski, Andelfingen, both of Switzerland, assignors to Von Roll AG, Gerlafingen, Switzerland

Filed Mar. 1, 1978, Ser. No. 882,403
Claims priority, application Switzerland, Mar. 7, 1977, 2821/77
Int. Cl.[2] F23G 5/00
U.S. Cl. 110—216 **19 Claims**

1. An apparatus for separating fly ash particles from a flue gas flow in combustion furnaces with a multiple flue boiler, comprising:

a first vertical flue;

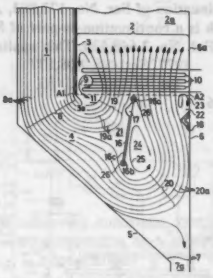
a second vertical flue;

a lower deflector section interconnecting said first and said second flues and adapted to conduct a flue gas flow from said first flue into said second flue;

a deflecting plate disposed in said deflector section having an incident surface in a confronting relationship with said flue gas flow, said deflecting plate being adapted to divide said flue gas flow into an inner first flow and an outer second flow to direct said inner first flow toward said second flue, and to produce radial centrifugal forces in said inner first flow sufficient to separate fly ash particles therefrom;

a first projection provided on said incident surface of said deflecting plate and adapted to modify passage of said inner first flow into said second flue;

a wall defining a boundary of said lower deflector section adjacent said second vertical flue and disposed in a spaced relationship to said deflecting plate and in a confronting relationship with said outer second flow, said wall being adapted to confine and direct said outer second flow toward said second flue and to produce radial centrifugal forces in said outer second flow sufficient to separate fly ash particles therefrom;



a second projection provided on said wall adapted to modify passage of said outer second flow into said second flue; and

hopper means in communication with said lower deflector section for receiving from said lower deflector section fly ash particles deposited therein by said outer second flow and said inner first flow;

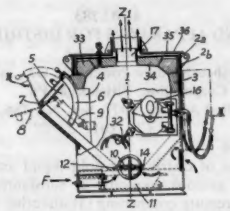
said first projection, said deflecting plate, said lower deflector boundary wall and said second projection being operable in combination to produce in said second flue a flow of flue gases having a substantially uniform cross-sectional velocity distribution and having a substantially uniform cross-sectional distribution of fly ash particles.

4,202,281

POLYVALENT INCINERATOR FOR SOLID AND/OR LIQUID WASTE

Jean-Claude L. Pillard, Marseilles, France, assignor to Entreprise Generale de Chauffage Industriel Pillard, Marseilles, France

Filed Apr. 26, 1978, Ser. No. 900,117
Claims priority, application France, Apr. 29, 1977, 77 13639
Int. Cl.[2] F23G 5/00
U.S. Cl. 110—259 **8 Claims**



1. A polyvalent incinerator for solid and/or liquid waste comprising a vertical and cylindrical combustion chamber

provided with an opening for the evacuation of the ashes which is located in the bottom and which is fitted with a grate; with an opening for the loading of solid waste; with a chimney shaft which opens out at the upper end of said chamber; and with one single burner which opens out tangentially in said chamber, which burner comprises both means for supplying it with liquid fuel and means for intimately mixing pollutant liquid waste with said fuel inside said burner.

4,202,282

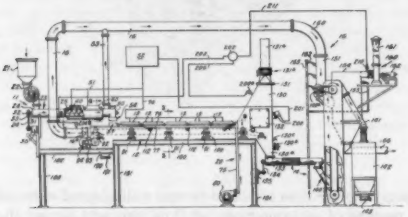
METHOD OF INCINERATION

Jim F. Hobbs, 618 Winchester Dr., Richardson, Tex. 75080, and Craig Smyser, 4013 Miramar, Dallas, Tex. 75202

Division of Ser. No. 627,651, Oct. 31, 1975, which is a continuation of Ser. No. 423,398, Dec. 10, 1973, abandoned, which is a continuation of Ser. No. 173,803, Aug. 23, 1971, abandoned, which is a continuation-in-part of Ser. No. 38,936, May 20, 1970, Pat. No. 3,648,630. This application Jun. 20, 1977, Ser. No. 808,177

Int. Cl.[2] F23G *5/10*

U.S. Cl. 110—346 **7 Claims**



1. A method of thermally processing materials having volatile components comprising:

introducing said materials into a housing defining an elongated chamber having an inlet end and a discharge end;

moving the materials on a conveyor belt supported on rollers along said chamber from said inlet end to said discharge end;

directing infrared rays from said housing on said materials on said conveyor belt as said belt moves said materials along said chamber, said materials releasing gases and being dried as a result of heating from said infrared rays;

removing processed materials from said chamber at the discharge end of said chamber;

inducing a draft of air through said chamber in order to create a mixture of air and gases which flows over and generally parallel to said materials along said belt in order to provide a portion of the heat required for drying of said materials;

sensing the temperature within said chamber, and

varying the temperature of said draft in response to the sensed temperature in order to maintain a prescribed temperature for optimum processing of said materials.

4,202,283

PROCESS AND APPARATUS FOR DISTRIBUTING COLD AMMONIA

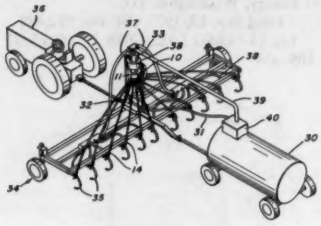
Robert A. Wiesboeck, Stone Mountain, Ga., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Apr. 11, 1977, Ser. No. 786,302

Int. Cl.[2] A01C *23/02*

U.S. Cl. 111—6 **25 Claims**

1. A process of distributing cold liquid ammonia substantially free of gaseous ammonia at substantially ambient or atmospheric pressure comprising (1) directing an initial stream of the liquid ammonia downward by gravity flow against a splash plate having a flat surface, the plane of the flat surface being positioned in a generally horizontal direction and at a substantially orthogonal direction relative to the axis of the initial ammonia stream, the stream making contact with the flat surface within an enclosed chamber and in a manner such that a flow of liquid is formed on the flat surface to achieve effective distribution when tilting the flat surface by up to about 10 degrees from the horizontal position while maintaining the direction of the axis of the stream relative to the plane of the flat surface substantially constant, and (2) passing the liquid ammonia from the flat surface to a plurality of outlets to thereby cause a division of the cold, liquid ammonia, wherein



the axis of the initial stream of cold liquid ammonia is essentially vertical and wherein the length of the vertical stream is at least about 6 inches, and wherein the initial cold liquid ammonia stream is carried by a cylindrical conduit and the end of such conduit is in a plane essentially parallel to the plane of the flat surface and wherein the distance between the end of the cylindrical conduit and the flat surface is equal to between about $\frac{1}{8}$ to about $\frac{1}{4}$ of the average diameter of the cylindrical conduit.

4,202,284

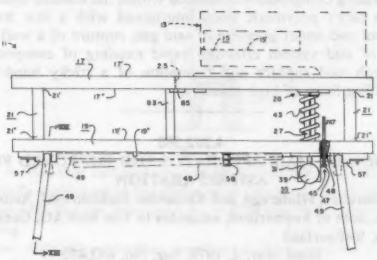
SEWING MACHINE TABLE

Joe T. Parsons, Sr., P.O. Box 445, Osceola, Ark. 72370

Filed Dec. 29, 1978, Ser. No. 974,344

Int. Cl.[2] D05B *75/02*

U.S. Cl. 112—217.1 **8 Claims**



1. A table comprising:

(a) a top member having an opening therethrough;

(b) a secondary member disposed beneath said top member a spaced apart distance, said secondary member having an aperture therethrough;

(c) means for fixedly attaching said top member and said secondary member to one another;

(d) a platform member having a size and shape complementary with said opening in said top member for movement between a first position with the top surface of said platform member horizontally aligned with the top surface of said top member and numerous positions with the top surface of said platform member spaced beneath the top surface of said top member;

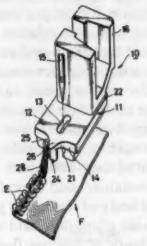
(e) lock means for locking said platform member in any of said first or numerous positions;
(f) spring means for urging said platform member to said first positions; and
(g) alignment means for maintaining said platform member in vertical alignment with said opening in said top member, said alignment means including a post member fixedly attached to the bottom surface of said platform member and depending downwardly therefrom, said alignment means including a collar member attached to the bottom surface of said secondary member, said collar member having an aperture therethrough, said apertures through said secondary member and said collar member being aligned with one another and being slightly larger in cross sectional area than said post member to slidably receive said post member, said post member and said aperture through said collar member being substantially square in cross sectional area.

4,202,285

PRESSER FOOT FOR CONCEALED SLIDE FASTENERS

Yoshihiro Kanzaka, Nyuzen, Japan, assignor to Yoshida-Kogyo K.K., Tokyo, Japan

Filed Sep. 11, 1978, Ser. No. 941,284
Claims priority, application Japan, Sep. 20, 1977, 52-126709
Int. Cl.[2] D05B *29/00*
U.S. Cl. 112—235 **2 Claims**



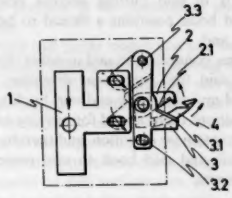
1. A presser foot for sewing to garments or the like, the stringer tapes of a slide fastener in which a row of fastener elements is secured to a lengthwise section of a longitudinal folded edge portion of a corresponding stringer tape and a lengthwise section of said tape edge portion is free of fastener elements; which presser foot comprises: a plate member having a generally flat bottom surface which engages, at least in part, the stringer tape; a slot in said plate member extended therethrough for receiving a sewing needle that stitches through the stringer tape, a pair of longitudinal grooves in said plate member and opening at the bottom surface thereof, each groove having an orientation to guide through the presser foot a row of fastener elements secured to the corresponding stringer tape; a partition having a generally V-shaped transverse profile and extending longitudinally between said grooves and in central relation therewith, said partition being interrupted by said slot to define front and rear partition members spaced apart from each other by the distance across said slot, said partition members each having a bottom surface terminating short of the bottom surface of said plate, said front partition member having a surface disposed to engage the stringer tape along the fastener element section of the folded edge portion thereof to position the fastener tape in at least a partially unfolded attitude within one of said grooves, said front partition member having a lug projecting downwardly with the lowermost end thereof lieing substantially in surface registration with the bottom surface of the plate said lug extending laterally beyond both sides of said front partition member, said lug cooperating with the bottom surfaces of said partition members to maintain the stringer tape in guided relation with the presser foot for sewing along a predetermined line with respect to the folded edge portion of the stringer tape, said lug being disposed to engage the stringer tape to maintain the fastener element-free section thereof in a given alignment with respect to the corresponding groove for sewing along said line.

4,202,286

UNIVERSAL THREAD CUTTING DEVICE AND COMPLEMENTARY DEVICES APPLICABLE TO SEWING MACHINES

Alfonso Freire Costas, Vigo, Spain, assignor to Industrias P. Freire, S.A., Bouzas-Vigo, Spain

Filed Mar. 30, 1978, Ser. No. 891,844
Int. Cl.[2] D05B *65/02*
U.S. Cl. 112—286 **17 Claims**



1. A system for achieving automatic synchronized thread cutting during a sewing operation on a sewing machine, said system comprising, in combination:
a thread cutting device adapted to be mounted on a sewing machine, said thread cutting device comprising:
a support plate adapted to be mounted on a sewing machine in place of common sliding elements thereof;
a fixed knife fixedly mounted on said support plate;
a member supported by said support plate for movement in first and second opposite rectilinear directions extending parallel to a direction of sewing of the sewing machine;
a movable knife pivoted to said member and to said fixed knife for pivoting movement with respect thereto between an open first position spaced from said fixed knife and a cutting second position against said fixed knife;
a thread collecting hook pivoted to said member for pivoting movement with respect thereto between a first position between said fixed and movable knives when said movable knife is in said open first position thereof, whereat said hook is positioned to gather a thread to be cut, and a second position adjacent said fixed knife when said movable knife is in said cutting second position thereof, whereat said hook positions a thread to be cut between said knives; and
actuating means, connected to said member, for moving said member in said first rectilinear direction, and thereby pivoting said movable knife and said hook to said respective first positions thereof, and for moving said member in said second rectilinear direction, and thereby pivoting said movable knife and said hook to said respective second positions thereof;
thread withdrawing means, adapted to be mounted on a presser-bar of the sewing machine, and operatively connected to said actuating means, for withdrawing a thread cut by said thread cutting device from beneath the presser-bar; and
thread tension releasing means, operatively connected to said actuating means, and adapted to be incorporated into a thread tensioning device of the sewing machine, for releasing tension on a thread which has been cut by said thread cutting device.

14. A thread cutting device adapted to be mounted on a sewing machine, said thread cutting device comprising:
a support plate adapted to be mounted on a sewing machine in place of common sliding elements thereof;

a fixed knife fixedly mounted on said support plate;

a member supported by said support plate for movement in first and second opposite rectilinear directions extending parallel to a direction of sewing of the sewing machine;

a movable knife pivoted to said member and to said fixed knife for pivoting movement with respect thereto between an open first position spaced from said fixed knife and a cutting second position against said fixed knife;

a thread collecting hook pivoted to said member for pivoting movement with respect thereto between a first position between said fixed and movable knives when said movable knife is in said open first position thereof, whereat said hook is positioned to gather a thread to be cut, and a second position adjacent said fixed knife when said movable knife is in said cutting second position thereof, whereat said hook positions a thread to be cut between said knives; and

actuating means, connected to said member, for moving said member in said first rectilinear direction, and thereby pivoting said movable knife and said hook to said respective first positions thereof, and for moving said member in said second rectilinear direction, and thereby pivoting said movable knife and said hook to said respective second positions thereof.

4,202,287

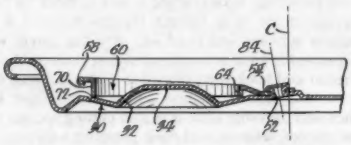
METHOD OF ATTACHING TAB TO END PANEL

Arthur P. Zundel, Mount Prospect, Ill., assignor to National Can Corporation, Chicago, Ill.

Division of Ser. No. 873,548, Jan. 30, 1978, Pat. No. 4,148,409, which is a continuation-in-part of Ser. No. 789,096, Apr. 20, 1977, abandoned. This application Nov. 20, 1978, Ser. No. 962,078

Int. Cl.[2] B21D *51/44*

U.S. Cl. 113—121 C **7 Claims**



1. A method of attaching a metal tab with a connecting end having an opening to a metal end closure, said metal end closure having a weakened line located below said metal tab to define a substantially circular removable section and said tab having a flange extending from the periphery of the opening toward the removable section and located inside the weakened line, said flange having an outwardly directed portion on a free edge thereof directed away from said connecting end at a location remote from said connecting end, comprising the steps forming a hollow rivet in said end closure, positioning the said tab on said end closure with said opening surrounding said hollow rivet, deforming said hollow rivet to permanently secure said tab to said end closure and locate said outwardly directed portion outside an inner edge of said weakened line, reforming at least a portion of said end closure adjacent said rivet to stress the metal in said connecting end to cause said tab to be urged toward an adjacent surface of said end closure, and attaching the end closure to a container having pressurized contents so that said outer end of said outwardly directed portion is moved inside the inner edge of said weakened line.

4,202,288

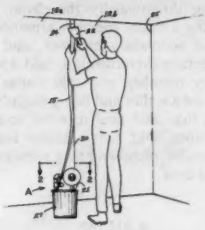
DRY WALL TAPE DISPENSER

Edward Davy, Jr., 505 N. Parkhill St., West Frankfort, Ill. 62856

Filed Oct. 30, 1978, Ser. No. 955,947

Int. Cl.[2] B05C *11/00, 3/00*

U.S. Cl. 118—41 **23 Claims**



1. For use with a bucket-like container adapted for holding a body of tape coating fluid and having a bottom wall and side walls extending upward therefrom to a top opening, said side walls and bottom wall forming an inside bottom corner, apparatus for dispensing coated tape comprising support means for interengagement with portions of said container including an upper extension extending upwardly from said container including tape support means for supporting a roll of uncoated tape and for positioning said roll relative to said opening to facilitate unrolling of said tape from said roll into said opening, and a lower extension extending downwardly into said container adjacent one side wall, a guide carried by said lower extension proximate the said inside bottom corner of said container, means extending from said lower extension laterally toward and proximate said opposite side wall and spanning substantially the width of said container for stabilizing said apparatus within said container, said laterally extending means being immersible in said body of fluid, said guide being adapted for guiding tape to provide a length of said tape extending from said opening into said body of coating fluid to a point proximate the bottom of said container with said tape then extending from said guide to said opening to reach said opening in thoroughly coated condition, and scraper means proximate said opening including an edge for scraping of one face of the coated tape to wipe coating fluid from said face whereby the other face of said tape remains coated as said tape is pulled from said opening.

4,202,289

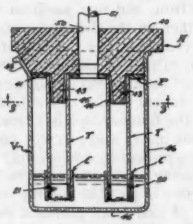
SPECIMEN PROCESSING APPARATUS FOR MICROSCOPY

Robert F. Bils, 816 Westmoreland Dr., Montebello, Calif. 90640

Filed Jul. 10, 1978, Ser. No. 923,099

Int. Cl.[2] C23C *13/08*

U.S. Cl. 118—50 **41 Claims**



1. A specimen processing apparatus useful in preparing tissue for miscroscopy and the like, and including; a shallow

sieve cup comprised of an open ended tube member and a screen member extending coextensively across one end thereof, and an elongated handling tube removably press fitted into the other end of the open ended tube member of the sieve cup, whereby a specimen immersed in liquid entering through the said screen member is accessible thereafter by removal of said handling tube from the shallow sieve cup.

28. A specimen processing apparatus useful in preparing tissue for microscopy and the like, and including; a header for carrying the apparatus and having a multiplicity of connectors faced downwardly therefrom, a shallow sieve cup complementing each of said seive cups and each comprised of an open ended tube member and a screen member extending coextensively across one bottom end thereof, and an open ended elongated handling tube removably press fitted into the other end of the open ended tube member of each sieve cup and to each complementary connector of the header, whereby a multiplicity of specimens supported upon said screen members are transportable by means of said header through immersion in liquid entering through said screen members and are accessible thereafter by removal of said handling tubes from the shallow sieve cups.

35. A specimen processing apparatus useful in preparing tissue for microscopy and the like, and including; a base holder for apparatus support and having a multiplicity of shallow recesses opening upwardly therein, a shallow sieve cup complementing each of said shallow recesses and removably received therein respectively, each of said sieve cups comprising an open ended tube member and a screen member extending coextensively across one bottom end thereof, a header for carrying the apparatus and having a multiplicity of connectors faced downwardly therefrom, and an open ended elongated handling tube removably press fitted into the other end of the open ended tube member of each sieve cup and to each complementary connector of the header, whereby a multiplicity of specimens supported upon said screen members are transportable by means of said header through immersion in liquid entering through said screen members and are accessible thereafter by removal of said handling tubes from the shallow sieve cups.

4,202,290

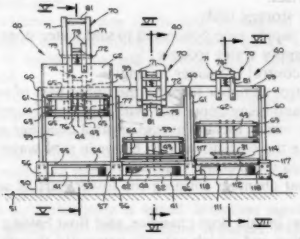
APPARATUS FOR DECORATING SURFACES OF CERAMIC WARE

David G. Hatfield, La Canada, Calif., assignor to Interpace Corporation, Parsippany, N.J.

Continuation of Ser. No. 786,189, Apr. 11, 1977, abandoned, which is a division of Ser. No. 660,489, Feb. 23, 1976, abandoned. This application Jun. 14, 1978, Ser. No. 915,408

Int. Cl.[2] B05C *1/02*

U.S. Cl. 118—211 **4 Claims**



1. Means for decorating a surface area of a ceramic body in which the surface area may vary in elevation as a result of design and tolerances, the combination of:

a plurality of decorating members arranged to define a design for deposit on said surface area;

each decorating member having a support and guide rod provided with a fixed stop face;

means supporting and guiding said decorating members for vertical non-rotational movement of the members along parallel vertical paths above a receptacle adapted to contain colorant composition material;

means for removably positioning said ceramic body in registration with the design defined by said plurality of decorating members and above said receptacle;

said supporting and guiding means being reciprocally movable only in a vertical direction for movement of said decorating members along said parallel vertical paths with said stop face on each member in resting contact therewith without relative movement of said decorating members with respect to said supporting and guiding means, whereby said decorating members are adapted to pick up composition material from said receptacle and said decorating members are carried to a raised position located above the position of the positioning means for said ceramic body;

said supporting and guide means and said support and guide rods on said decorating members having means to provide during lowering of the supporting and guide means and upon gravitational contact of said decorating members with said surface area unrestricted free vertical downward movement of the supporting and guide means with respect to said decorating members during deposit of said composition material on said surface area, said stop face on each decorating member being displaceable into spaced relation with said supporting and guiding means to compensate for variations in the surface area.

4,202,291

METHOD FOR KEEPING AQUATIC ANIMALS ALIVE OVER LONG PERIOD OF TIME

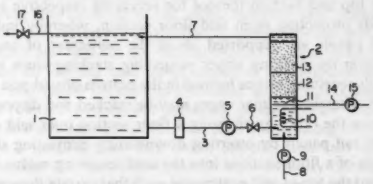
Naoya Kominami; Hirokazu Fukumi; Naokuni Yamawaki, and Junji Nomura, all of Fuji, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 1, 1977, Ser. No. 802,338

Claims priority, application Japan, Jun. 8, 1976, 51-66814

Int. Cl.[2] A01K *63/00*

U.S. Cl. 119—3 **20 Claims**



1. A method for keeping aquatic animals alive over a long period of time substantially without feeding them and in a high density in environmental water, comprising the steps of:

(A) placing aquatic animals in environmental water;

(B) controlling the temperature of said environmental water so that said temperature is maintained at the lowest possible temperature range in which said aquatic animals are able to exist;

(C) controlling ammonia compounds in said environmental water so that the total concentration thereof does not exceed 20 ppm;

(D) controlling water-soluble organic compounds in said environmental water so that the total concentration thereof does not exceed 150 ppm;

(E) controlling carbonic acid radical in said environmental water so that it does not exceed a concentration of 1000 ppm and;

(F) regulating molecular oxygen dissolved in the environmental water so that its concentration is maintained at 3 ppm or more, the concentrations of said ammonia compounds and water-soluble organic compounds in said

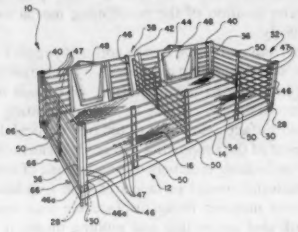
environmental water being controlled by bringing said environmental water into contact with a hypohalite so as to oxidize said ammonia compounds and said organic compounds therein while the hypohalite is converted to halide non-toxic to said aquatic animals.

4,202,292

MODULAR PIG CAGE ASSEMBLY

C. Gene Strickland, Spring Hope, N.C. 27882

Filed May 1, 1978, Ser. No. 901,590
Int. Cl.[2] A01K *1/02*
U.S. Cl. 119—20 **13 Claims**



1. A modular cage assembly for confining animals such as pigs and the like comprising: a floor section having an perforated metal floor; a plurality of vertically oriented stacking studs secured about the perimeter of said floor section at selected intervals, said stacking studs including upwardly projecting studs that project above the perforated floor and downwardly projections studs that project downwardly from the perforated floor; a plurality of detachable and independent rail panels having post means adapted to be supported about the perimeter of said floor section, said plurality of rail panels including at least two side rail panels and at least two end rail panels; stud receiving means formed in said post means at both the top and bottom thereof for receiving respective stacking studs projecting from said floor section, whereby individual rail panels are supported about the perimeter of said floor section by inserting upper projecting stacking studs into the studs receiving means formed in the bottom of said post means, and wherein modular cages may be stacked and disposed one above the other by situating a floor section over said detachable rail panels by inserting downwardly projecting stacking studs of a floor sections into the stud receiving means formed about the top of said post means such that certain floor sections are directly supported by underlying detachable rail panels.

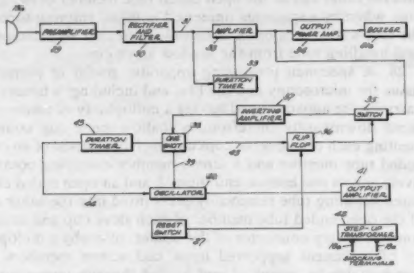
4,202,293

DOG TRAINING COLLARS AND METHODS

Gerald J. Gonda, and John Vancza, Jr., both of Tucson, Ariz., assignors to Tri-Tronics, Inc., Tucson, Ariz.

Filed Jan. 31, 1978, Ser. No. 874,033
Int. Cl.[2] A01K *15/00*
U.S. Cl. 119—29 **18 Claims**

1. A dog training device comprising:
a case adapted to be carried by a dog collar;
sound producing means carried by said case and adapted while the device is being worn by a dog to emit a sound intended to urge the dog to stop barking;
shocking means carried by said case and operable to electrically shock a dog wearing the device; and
control means operable to actuate said shocking means to shock the dog on an initial actuation of said sound producing means but not on subsequent actuations thereof, said control means including means for selectively resetting said shocking means, if necessary, to shock the dog on a next successive actuation of said sound producing means



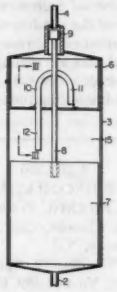
following each reset operation, but not on other actuations thereof.

4,202,294

AUTOMATIC WATER SUPPLY SYSTEM FOR BREEDING OR RAISING ANIMALS

Nobuharu Kasai, 32, Aza Ipponyanagi, Oaza Tanuma, Onoemachi, Minamitsugaru-gun, Aomori-ken, Japan

Filed Mar. 29, 1978, Ser. No. 891,172
Claims priority, application Japan, Mar. 31, 1977, 52/37062
Int. Cl.[2] A01K *7/04*
U.S. Cl. 119—78 **3 Claims**



1. An automatic water supply system for raising animals which comprises:
(a) a water storage tank;
(b) a water supply pipe connected to said water storage tank;
(c) a self-supply water trough;
(d) a flow control container having:
(i) a control chamber forming the upper part of said container and being connected with said water supply pipe;
(ii) valve means located in said control chamber and controlling the communication between said water supply pipe and said control chamber;
(iii) a float chamber forming the lower part of said container;
(iv) a float in said float chamber, said float having a valve activating rod which extends upwardly therefrom and passes through the bottom of said control chamber and which is adapted to open and close said valve means, said valve means thereby responding to the water level in said float chamber, so as to regulate the inflow of water from said water storage tank through said water supply pipe into said control chamber; and
(v) an inverted J-shape siphon having an elongated rectangular or oval cross-section; said siphon connecting said control chamber and said float chamber, the open end

of the short leg of said siphon being spaced above the bottom of said control chamber by a small predetermined distance, while the long leg of said siphon is extended through the bottom of said control chamber into said float chamber; and

(e) a water feed pipe, the lower end of which is placed in said self-supply water trough at a suitable distance above the bottom thereof and the upper end of which is connected to the bottom of said float chamber.

4,202,295

FUEL SUPPLY CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES

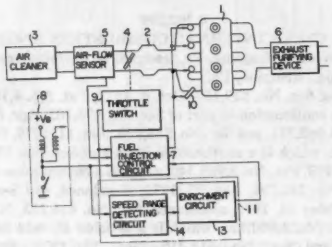
Toshio Kondo, Anjo; Susumu Harada, Oobu; Nobuyuki Ito, Hekinan, and Nobuyuki Kobayashi, Toyota, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed May 6, 1977, Ser. No. 794,648

Claims priority, application Japan, Sep. 23, 1976, 51-114213

Int. Cl.[2] F02B 3/00

U.S. Cl. 123—32 EH **1 Claim**



1. A fuel supply control system for an internal combustion engine, said engine having associated therewith an exhaust gas purifying device, said fuel supply control system comprising:

means for supplying fuel to said engine in accordance with operating conditions of said engine, said fuel supplying means including;

an air-flow sensor, positioned upstream of said throttle valve, for generating an air-flow signal which increases as the amount of air sucked into said engine increases;

an ignition device for generating an ignition signal at an interval which decreases as the rotational speed of said engine increases;

a fuel injector, positioned downstream of said throttle valve, for injecting fuel into said engine during the opening thereof, and;

an electronic injection controller, connected to said fuel injector, for controlling the opening period of said injector in response to said air-flow signal and said ignition signal;

means for generating a load detection signal when said engine is under the heavy load condition, said load signal generating means including;

a throttle switch, coupled to said throttle valve, for generating said load detection signal when said throttle valve is fully opened;

means for generating a speed detection signal when the rotational speed of said engine is higher than a predetermined speed, said speed detection signal generating means including;

a divider, connected to said ignition device, for generating a first pulse having a time width which decreases as said rotational speed increases;

a monostable multivibrator, connected to said divider, for generating a second pulse having a constant time width which corresponds to said predetermined speed in synchronization with said first pulse signal, and;

a comparator, connected to receive said first pulse and said second pulse, for comparing said time width of said first pulse with said constant time width of said second pulse;

means for generating an enrichment signal when at least one of said load detection signal and said speed detection signals is generated; and

means for supplying additional fuel into said engine when said enrichment signal is generated, whereby overheating of said purifying device is prevented.

4,202,296

COOLING SYSTEM FOR INTERNAL COMBUSTION ENGINES

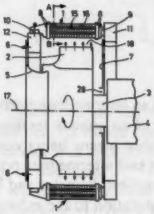
Manfred Nonnenmann, Schwieberdingen; Kurt Hauser, and Gebhard Schwarz, both of Stuttgart, all of Fed. Rep. of Germany, assignors to Suddeutsche Kuhlerfabrik Julius Fr. Behr GmbH & Co. K.G., Stuttgart, Fed. Rep. of Germany

Filed Dec. 13, 1977, Ser. No. 860,089

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1976, 2657840

Int. Cl.[2] F01P 5/06

U.S. Cl. 123—41.48 **25 Claims**



1. In a quiet cooling system for internal combustion engines, the system including a radial impeller having a circumference and a rotational axis, a ring radiator disposed about the circumference of the radial impeller at a distance from the latter, the radiator having cooling water tubes which are to carry water, and cooling fins fastened to the tubes, wherein said cooling water tubes run substantially parallel to said rotational axis of said impeller and said fins are located parallel to flow direction of cooling air leaving said radial impeller, the improvement wherein said radial impeller is provided with a cover plate having a rounded portion and including an inlet nozzle which projects into said radial impeller, said inlet nozzle being shaped to define a gap between said radial impeller and said inlet nozzle so that the main flow receives an outwardly directed component and the air entering between said impeller and said nozzle is supplied at least nearly tangentially to said rounded portion of said cover plate, and wherein said inlet nozzle is connected to said cover plate of said radial impeller and turns with the latter.

4,202,297

TWO-STROKE ENGINE HAVING VARIABLE EXHAUST PORT TIMING

Yuji Oku, and Yasuharu Tsuyama, both of Iwata, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Jun. 19, 1978, Ser. No. 916,751

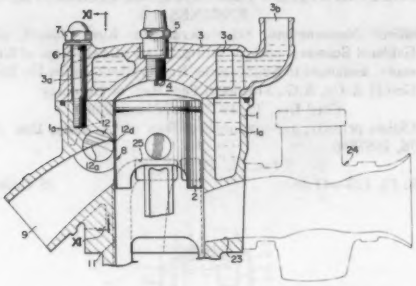
Claims priority, application Japan, Jun. 22, 1977, 52-82848[U]; Sep. 29, 1977, 52-131349[U]

Int. Cl.[2] F02B 75/02

U.S. Cl. 123—65 PE **3 Claims**

1. Two-stroke internal combustion engine comprising cylinder means having cylinder wall means formed with exhaust port means and scavenging port means, piston means disposed in said cylinder means for movement so that the exhaust and scavenging port means are cyclically closed by said piston means, exhaust passage means communicating with said exhaust port means, scavenging passage means communicating

with said scavenging port means for passing fresh charge of intake gas into the cylinder means when the scavenging port means is opened by the piston means, exhaust port timing control means provided in said exhaust passage means adjacent to said exhaust port means, said exhaust port timing control means including rotary control member means having an axis extending transversely across the exhaust passage means at an upper portion thereof and having a general configuration in which diametrical dimension is gradually decreased from opposite ends towards an intermediate portion thereof to provide an external contour of an arcuate sectional configuration, said rotary control member means being comprised of two parts which are divided at said intermediate portion where the member means has the smallest diameter and being partially cut off to conform in configuration to the exhaust passage means and being movable between a retracted position wherein the cut off is aligned with the exhaust passage means and a projected position wherein an edge of the cut off is projected into the exhaust passage means.



4,202,298

FUEL PORTING FOR TWO CYCLE INTERNAL COMBUSTION ENGINE

Eyvind Boyesen, Kempton, Pa., assignor to Performance Industries, Inc., Kempton, Pa.

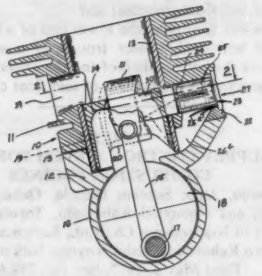
Continuation-in-part of Ser. No. 859,476, Dec. 12, 1977, and a continuation-in-part of Ser. No. 839,180, Oct. 4, 1977, which is a continuation-in-part of Ser. No. 674,102, Apr. 6, 1976, Pat. No. 4,062,331, which is a continuation-in-part of Ser. No. 586,138, Jun. 11, 1975, Pat. No. 4,051,820, which is a continuation-in-part of Ser. No. 375,065, Jun. 29, 1973, Pat. No. 3,905,340, which is a continuation-in-part of Ser. No. 282,734, Aug. 22, 1972, abandoned, which is a continuation-in-part of Ser. No. 361,407, May 18, 1973, abandoned. This application Sep. 12, 1978, Ser. No. 941,596

The portion of the term of this patent subsequent to Jul. 17, 1996, has been disclaimed.

Int. Cl.[2] **F02B** *33/00*

U.S. Cl. 123—73 R **9 Claims**

1. A variable speed, two-cycle, crankcase compression, internal combustion engine comprising a cylinder, a piston working in the cylinder, a crankcase, an intake port in the cylinder in fluid communication with the crankcase, an intake tract in fluid communication with the intake port, valve means disposed in the intake tract for controlling the flow of fluid therethrough, a transfer port in the cylinder, and a transfer passage, one end of which communicates with the transfer port and the other end of which communicates with the crankcase, below the piston, for conveying fluid from the crankcase to the transfer port, the communication of the intake port with the crankcase being independent of the transfer passage, and a region of the transfer passage intermediate its ends being in communication with the intake tract downstream of the valve means and providing for flow of fluid from the intake tract directly into the transfer passage.



4,202,299

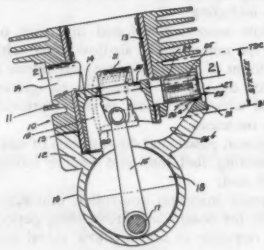
TWO CYCLE INTERNAL COMBUSTION ENGINE

Eyvind Boyesen, Kempton, Pa., assignor to Performance Industries, Inc., Kempton, Pa.

Division of Ser. No. 839,180, Oct. 4, 1977, Pat. No. 4,161,163, which is a continuation-in-part of Ser. No. 674,102, Apr. 6, 1976, Pat. No. 4,062,331, and Ser. No. 586,138, Jun. 11, 1975, Pat. No. 4,051,820, which is a continuation-in-part of Ser. No. 375,065, Jun. 29, 1973, Pat. No. 3,905,340, which is a continuation-in-part of Ser. No. 282,734, Aug. 22, 1972, abandoned, and Ser. No. 361,407, May 18, 1973, abandoned, Ser. No. 416,213, Nov. 15, 1973, Pat. No. 4,000,723, which is a division of, said Ser. No. 375,065, and Ser. No. 416,215, Nov. 15, 1973, Pat. No. 3,905,341, which is a division of, said Ser. No. 375,065, Jun. 29, 1973. This application Oct. 10, 1978, Ser. No. 949,863

Int. Cl.[2] **F02B** *33/04*

U.S. Cl. 123—73 A **4 Claims**



1. A variable speed, two-cycle, crankcase compression internal combustion engine comprising a cylinder, a piston working in the cylinder, a crankcase having a crank space below the cylinder, a combustion chamber above the piston and a fuel flow space immediately below the piston but above the crank space even in bottom dead center position of the piston, fuel intake porting and passage means for supplying fuel to the engine and including fuel intake porting in the cylinder wall confronting the bottom dead center position of the piston and being of sufficient axial dimension to supply fuel to said fuel space immediately below the piston throughout at least a substantial part of the upward stroke of the piston and further including a fuel tract approaching the cylinder in the region of said intake porting above said fuel space, a fuel transfer system having transfer porting through the cylinder wall above the piston in bottom dead center position and comprising passage means having uninterrupted communication with said fuel

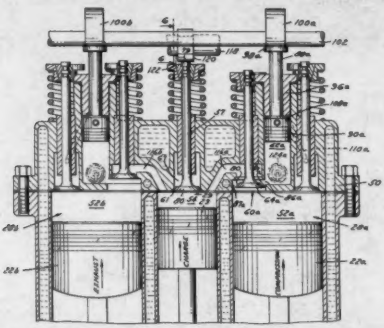
space, a fuel supply passage having communication with said fuel space below the piston independently of the intake porting in the cylinder wall throughout the cycle of the engine, the communication of the transfer passage means and of the fuel supply passage with said fuel space being independent of each other, and reed valve means controlling the fuel supply to said intake porting and to said fuel supply passage.

4,202,300

INTERNAL COMBUSTION ENGINE

Frank Skay, 35 Rex Park, Canada Creek Ranch, Atlanta, Mich. 49709

Filed Feb. 22, 1978, Ser. No. 880,287
Int. Cl.[2] F02D *39/02*; F02B *33/00*
U.S. Cl. 123—75 B **62 Claims**



1. An internal combustion engine comprising: a pair of four cycle power cylinders, means for delivering an air/fuel mixture to each of the power cylinders, a variable volume charge chamber for each power cylinder communicating therewith, a two cycle charge cylinder for alternately supplying an air/fuel mixture to the charge chambers, means for delivering an air/fuel mixture to the charge cylinder, and valve means between the charge cylinder and charge chambers for controlling flow therebetween and for substantially segregating the air/fuel mixture delivered from the charge cylinder to the charge chamber from the air/fuel mixture within the power cylinder when the valve means permits communication between the charge chamber and the charge cylinder.

4,202,301

OXYGEN SENSOR CONTROL SYSTEM

Jack Early, Perth Amboy; John J. Mooney, Wyckoff, and Carl D. Keith, Summit, all of N.J., assignors to Engelhard Minerals & Chemicals Corporation, Iselin, N.J.

Filed Aug. 31, 1977, Ser. No. 829,555
Int. Cl.[2] F02D *3/00*
U.S. Cl. 123—119 EC **8 Claims**

1. In an internal combustion engine the improvement comprising:

an exhaust reduction and oxidation catalyst,

an air-to-fuel ratio control means to control the air-to-fuel ratio of the engine, said control means having a first state and a second state,

an oxygen sensor responsive to the level of oxygen in the exhaust upstream of said catalyst to provide an oxygen level signal, said oxygen sensor having a steep operating curve through the exhaust condition point that represents operation at a stoichiometric air to fuel ratio,

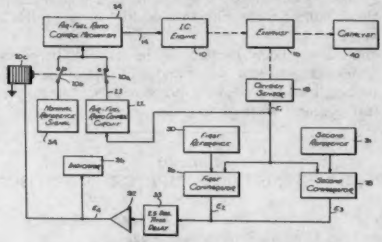
said control means, when in said first state, being responsive to said oxygen level signal, said signal biasing said control means in a direction tending to provide a predetermined average air-to-fuel ratio,

first comparator means responsive to said oxygen level signal to provide a first error signal when said oxygen level signal is greater than a first predetermined level,

second comparator means responsive to said oxygen level signal to provide a second error signal when said oxygen level signal is less than a second predetermined level,

one of said first and second predetermined levels representing combustion at substantially above said predetermined ratio and the other of said predetermined levels representing combustion at substantially under said predetermined ratio,

time delay means responsive to both of said error signals to provide a switching signal when either of said error signals persists for longer than a predetermined time period,



means to provide a predetermined reference signal simulating an input to said control means consistent with operation of said control means at approximately said predetermined average air-to-fuel ratio,

said control means, when in said second state, being responsive to said predetermined reference signal, and

switching means responsive to said switching signal to switch said air-to-fuel ratio control means from said first state to said second state when said switching signal is provided,

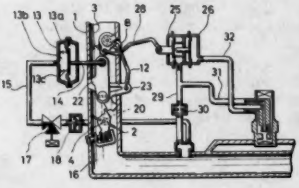
said oxygen level signal being uncoupled from said control means when said control means is in said second state and said predetermined reference signal being uncoupled from said control means when said control means is in said first state.

4,202,302

AUTOMATIC CHOKE ARRANGEMENT

Tetsuomi Tamura, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Dec. 20, 1978, Ser. No. 971,212
Claims priority, application Japan, Jul. 28, 1978, 53-092170
Int. Cl.[2] F02M *1/10*
U.S. Cl. 123—119 F **13 Claims**



1. An automatic choke comprising:

a choke valve;

a choke lever connected to said choke valve through a choke shaft for opening and closing said choke valve;

a choke return diaphragm having a negative pressure chamber located on one side of said diaphragm;

link means connecting said diaphragm to said choke lever

for rotation of the choke lever in response to movement of the diaphragm;

a spring engaging said choke lever to urge said choke valve in a direction to close the choke valve;

a temperature sensing valve in a conduit connecting said negative pressure chamber of said choke return diaphragm with a suction pipe downstream of a throttle valve, said temperature sensing valve comprising, means for connecting said negative pressure chamber to atmosphere when the temperature sensed is lower than a preset value, so that the spring urges the choke valve closed, and means for connecting said negative pressure chamber with said suction pipe when the temperature sensed is higher than the preset value, so that a negative pressure in the suction pipe is introduced into said negative pressure chamber to move said diaphragm and choke lever against the action of the spring to a position to open the choke valve; and,

check valve means located in the conduit between said temperature sensing valve and said suction pipe for preventing loss of a negative pressure in said negative pressure chamber through said suction pipe.

4,202,303

FUEL SYSTEMS FOR COMPRESSION IGNITION ENGINES

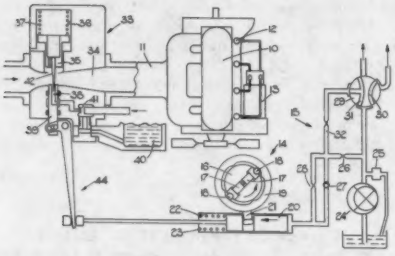
Dorian F. Mowbray, Burnham, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Mar. 23, 1978, Ser. No. 889,298

Claims priority, application United Kingdom, Mar. 26, 1977, 12791/77

Int. Cl.[2] **F02M** *45/00*

U.S. Cl. 123—139 AQ **9 Claims**



1. A fuel system for supplying a high quality liquid fuel and a fuel of lower quality to a compression ignition engine having combustion spaces, comprising: a plurality of fuel injection nozzles for directing the high quality liquid fuel directly to the combustion spaces of the engine respectively, a fuel pumping apparatus connected to said injection nozzles for supplying the high quality fuel to the injection nozzles in turn and in timed relationship with the engine, said fuel pumping apparatus including a control means for adjusting the quantity of high quality fuel supplied to the combustion spaces and timing means for adjusting the timing of delivery of said fuel, said timing means being operatively connected to the engine so as to be responsive to the speed of the associated engine and the quantity of said fuel supplied to the engine, whereby with increasing engine speed the timing is advanced and for a given speed, the timing of delivery is retarded as the quantity of fuel delivered increases, an adjustable throttle disposed in a conduit conveying air to the combustion spaces of the engine, means for adjusting the size of said throttle in accordance with the air flow through the conduit, a fuel jet disposed to allow low quality fuel to flow into the stream of air passing through said conduit a tapered needle adjustably mounted in said fuel jet, said needle being operatively connected to said jet being adjustably mounted and operatively connected to said timing means, whereby the relative position of said needle and said jet is in part determined by the means which adjust the size of said throttle and in part by said timing means, and conduit means through which the low quality fuel is supplied to said jet.

4,202,304

INTERFERENCE PROTECTED ELECTRONIC IGNITION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

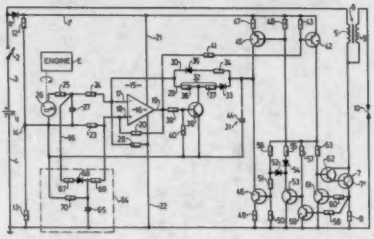
Werner Jundt, Ludwigsburg, and Bernd Bodig, Leinfelden, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 27, 1978, Ser. No. 919,617

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1977, 2729505

Int. Cl.[2] **F02P** *9/00*

U.S. Cl. 123—148 E **9 Claims**



1. Ignition system for an internal combustion engine (E) having

a signal generator (**26**) adapted to be coupled to the engine and providing an a-c signal in synchronism with the angular position of the shaft of the engine upon rotation of the engine, said signal having leading and trailing flanks;

an ignition coil (**5, 6, 9**);

a controlled switch (**7**) in series with the primary (**5**) of the ignition coil which, upon closing, permits current to flow through the coil to store electromagnetic energy therein and, upon opening , causes induction of a high voltage pulse in the secondary (**9**) to generate an ignition pulse;

a threshold switch (**15**) sensing when the leading and trailing flanks of the a-c signal pass respective threshold values (**U2, U3**);

connection means (**41, 42**) connected to the threshold switch and controlling closing and opening of the controlled switch (**7**);

and comprising, in accordance with the invention,

means (**64, 64'**) to positively associate a predetermined threshold value of the trailing flank with the response of the threshold switch (**15**) including

a supervisory circuit connected to and providing a supervisory bias voltage to the threshold switch (**15**) to bias the threshold switch to respond to the trailing flank of the signal from the signal generator (**26**) at predetermined angular positions of the shaft of the engine even in the presence of noise and disturbance voltages of the signal derived from the signal generator; and

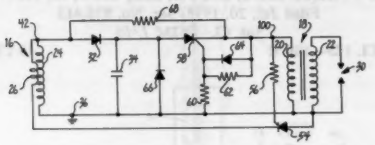
a circuit branch (**66**) connecting the signal generator (**26**) and the supervisory circuit (**64, 64'**) furnishing said bias voltage to thereby associate supply of the bias voltage with a predetermined angular position of the shaft of the engine and hence associate the instant of time that the trailing flank of the signal passes the respective threshold value (**U3**) with a predetermined angular position of the shaft of the engine.

4,202,305

CAPACITOR DISCHARGE IGNITION SYSTEM WITH TIMING STABILIZATION ARRANGEMENT

Ronald J. Wolf, Zanesville, Ind., assignor to Wabash, Inc., Wabash, Ind.

Filed Jul. 25, 1978, Ser. No. 927,773
Int. Cl.[2] F02P *3/06*
U.S. Cl. 123—148 CC **6 Claims**



1. In a capacitor discharge ignition system for use with a rotating permanent magnet including two poles that is rotated over a path in synchronism with the operation of an engine, the combination of:

means positioned adjacent the path of the permanent magnet for generating a charging supply and for generating a triggering signal in response to induced voltages and currents resulting from the rotating permanent magnet, said generating means comprising a control winding having induced therein a voltage and current of a first polarity to generate said charging supply in response to the passage of a first pole of the magnet and having induced therein a voltage and current of opposite polarity to said first polarity to generate said triggering signal in response to passage of the second pole of said magnet;

storage means connected to said generating means and being charged in response to said charging supply;

ignition coil means for generating an ignition voltage;

means responsive to said triggering signal for controlling the discharge of said storage means into said ignition coil means; and

means responsive to said rotating permanent magnet for stabilizing said triggering signal over a wide range of engine speeds, said stabilizing means being effective during the generation of said triggering signal and being inoperative during the generation of said charging supply, said stabilizing means comprising a stabilizing winding, one end of said stabilizing winding being connected to one end of said control winding, said connected coil ends of said stabilizing winding and said control winding being the winding ends having induced voltages of common polarity, said stabilizing means further comprising circuit means operative during the passage of said second magnet pole for connecting said stabilizing winding across said control winding such that said stabilizing winding and said control winding are in a series loop.

4,202,306

MULTI-POINT SPARK IGNITION ENGINE PROVIDED WITH EXHAUST RECIRCULATION CIRCUIT

Yasuo Nakajima, Yokosuka; Yoshimasa Hayashi, Yokohama, and Tooru Yoshimura, Yokosuka, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Continuation of Ser. No. 776,486, Mar. 10, 1977, Pat. No. 4,133,330. This application Oct. 24, 1978, Ser. No. 954,182
The portion of the term of this patent subsequent to Jan. 9, 1996, has been disclaimed.
Int. Cl.[2] F02P *1/00*; F02M *7/00*
U.S. Cl. 123—148 C **13 Claims**

1. An engine system comprising:

an internal combustion engine of the reciprocating piston type having an intake valve and an exhaust valve for each combustion chamber thereof;

an air-fuel proportioning means for supplying a combustible mixture of air and a hydrocarbon fuel to said engine;

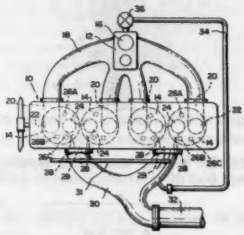
an exhaust recirculation means for recirculating a portion of the exhaust gas from the exhaust line of said engine to each combustion chamber together with said combustible mixture at a controlled volumetric flow rate relative to the volume of air admitted into each combustion chamber;

means for supplying secondary air to the exhaust line of said engine; and

at least two spark plugs which produce sparks substantially simultaneously for each combustion chamber;

said intake and exhaust valves being constructed and arranged such that a substantial overlap of the opening periods of said exhaust valve and said intake valve takes place, so that a substantial portion of the combustion gas is left unexhausted from each combustion chamber;

said combustion chamber being defined between the top face of the piston and the bottom face of a cylinder head by a



surface of revolution on the longitudinal axis of the cylinder bore;

the number of said at least two spark plugs being determined on the basis of a total volume of the recirculated exhaust gas and the unexhausted combustion gas relative to the volume of air supplied to each combustion chamber, said number being two when said total volume is about 50% of the volume of said air at the maximum and three when said total volume is about 60% at the maximum;

the spark gaps of said at least two spark plugs being arranged distant from each other in each combustion chamber such that, when the entire area of each combustion chamber in plan view is divided into a plurality of sectors which are in the same number as said at least two spark plugs and of approximately the same area, each of said sectors contains one of said spark gaps.

4,202,307

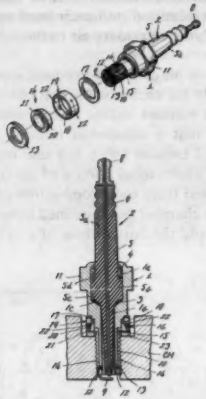
IGNITION PLUG

Yoshio Imamura, 12-8 Higashi-Cho, Fujinomiya-Shi, Shizuoka-Ken, Japan

Filed Nov. 2, 1978, Ser. No. 957,157
Claims priority, application Japan, Nov. 5, 1977, 52-132753
Int. Cl.[2] F02P *23/00*
U.S. Cl. 123—169 V **5 Claims**

1. An ignition plug for an internal combustion engine comprising a hollow cylindrical main body adapted to be mounted in the cylinder head of said engine and having jet orifices in communication with the hollow interior of said main body and air intake means in communication with said jet orifices; a tubular anode member including an insulation body extending through said main body and having a vertical through-opening and a center electrode extending through said vertical through-opening in the insulation body; and a check-valve assembly mounted about said main body and including a ring-shaped valve housing having a tapered valve seat on the inner

surface, a ring-shaped valve body reciprocally received in said valve housing and having a matingly tapered outer surface and



an annular seal for sealing said valve housing to said main body.

4,202,308

INTERNAL COMBUSTION ENGINE SYSTEM

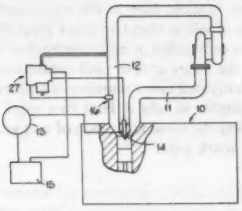
Barrie C. Skinner, Isleworth, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Jun. 28, 1978, Ser. No. 919,977

Claims priority, application United Kingdom, Jul. 13, 1977, 29364/77

Int. Cl.[2] **F02N** *17/00*; **F02M** *31/00*

U.S. Cl. 123—179 G **12 Claims**



1. An internal combustion engine including a starting aid system, the starting aid system comprising a starting aid device mounted on an air inlet manifold of the engine and including a fuel inlet, a fuel outlet to which in use fuel can flow from the fuel inlet to be admitted to said inlet manifold and means for vapourising and igniting the fuel flowing through the fuel outlet, a fuel supply device including a fuel chamber having an air inlet connected to said inlet manifold, a fuel inlet adapted to be connected to a fuel source, a fuel outlet connected to the fuel inlet of the starting aid device and valve means arranged to control communication between the air inlet, the fuel inlet and the fuel chamber, the valve means in a first position permitting communication between the fuel inlet and the fuel chamber but closing communication between the air inlet and the fuel chamber, and in a second position permitting communication between the air inlet and the fuel chamber so that air pressure in said inlet manifold is communicated to the fuel chamber but closing communication between the fuel inlet and the fuel chamber, and further valve means arranged to control communication between the fuel chamber of the fuel supply device and the fuel outlet of the starting aid device such that communication therebetween is permitted when the first mentioned valve means in its second position.

4,202,309

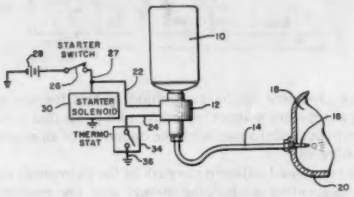
AUTOMATIC STARTING FLUID DISPENSER

James W. Burke, Rte. 2, Box 476, Long Grove, Ill. 60047

Filed Jul. 20, 1978, Ser. No. 926,413

Int. Cl.[2] **F02M** *1/16*

U.S. Cl. 123—180 R **19 Claims**



1. An apparatus for automatically injecting a pressurized starting fluid from a valved cannister into an air intake passage of an internal combustion engine provided with starter means, said apparatus comprising:

an injector mounted in the air intake passage to inject starting fluid into the passage;

an electrically activated valve actuator having an intake bore coupled to the valved cannister and an exit bore coupled to the injector, said valve actuator, when actuated, operating to continuously pass starting fluid from the valved cannister, through the intake and exit bores, to the injector;

reservoir means in fluid communication with the injector for temporarily storing a predetermined volume of starting fluid during the period when the valve actuator is activated, and for supplying said predetermined volume of starting fluid to the injector immediately following deactivation of the valve actuator;

means for automatically activating the valve actuator during operation of the starter means, such that the valve actuator is automatically controlled to cause starting fluid to be injected into the air intake passage during and immediately following operation of the starter means.

4,202,310

ANTI-CORROSIVE POLYMERIC COATING

Fermin Zorrilla, 6210 Maynada St., Coral Gables, Fla. 33146, and Agustin M. Alonso, 5471 W. 10th Ave., Hialeah, Fla. 33012

Filed Oct. 12, 1977, Ser. No. 841,476

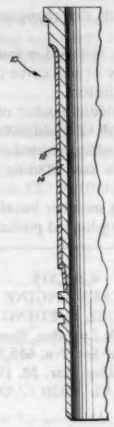
Int. Cl.[2] **F02F** *1/12*

U.S. Cl. 123—191 A **5 Claims**

1. In an internal combustion engine having a liquid coolant normally in contact with a liner of a cylinder, an improved liner comprising:

a rigid, thermally resistant, brittle coating which adheres to metallic surfaces, directly disposed on the liner over at least those surface portions thereof which would normally contact the liquid coolant, the coating consisting of a single layer of polymeric material selected from the group consisting of polystyrene, polymerized polyester resin, polyurethane, and polymerized epoxy resin, polymerized to form a hardened coating which conforms and adheres to said surface portions of the liner, wherein the coating is unreactive to a coolant liquid selected from the group

consisting of water, ethylene glycol, and mixtures thereof, and wherein the coating has a thickness of about ¼ to 1



micron so as to permit relatively unimpeded heat exchange therethrough.

4,202,311

MEANS FOR RESILIENTLY CONNECTING AN OIL PAN TO AN ENGINE BODY

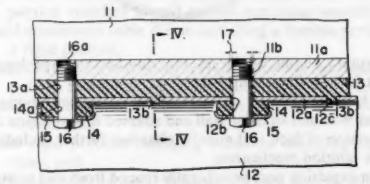
Hiroshi Moriyoshi, Aki, Japan, assignor to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Filed Jul. 26, 1978, Ser. No. 928,302

Claims priority, application Japan, Jul. 27, 1977, 52-101008[U]; Aug. 20, 1977, 52-111172[U]

Int. Cl.² F02F *7/00*

U.S. Cl. 123—195 C **6 Claims**



1. Internal combustion engine including an engine body having a lower end defined by a periphery, an oil pan having a periphery connected with the periphery of the engine body by means of a plurality of connecting bolts inserted through the oil pan into the engine body with bolt heads located beneath the oil pan, first resilient means disposed between the engine body and the oil pan and extending along said peripheries, individual second resilient means disposed about each bolt between the oil pan and a respective individual depressing plate means, the first resilient means, the oil pan, the second resilient means, and the depressing plate means being disposed between the engine body and the heads of the connecting bolts and having compressive pressure applied thereto by the connecting bolts, said second resilient means having coefficient of elasticity 2 to 4 times as great as that of the first resilient means so that compressive deformation of the second resilient means under load on the oil pan can be decreased and the depressing plate means having an upwardly bent edge, so that said second resilient means is held in position by said edge.

4,202,312

IGNITION DEVICE FOR ROTARY PISTON ENGINE

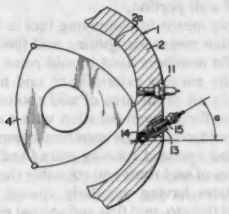
Kouichi Mori, Okazaki; Toshihiko Igashira, Toyokawa, and Shunzo Yamaguchi, Okazaki, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Mar. 15, 1978, Ser. No. 887,033

Claims priority, application Japan, Mar. 17, 1977, 52-29451

Int. Cl.² F02B *53/12*

U.S. Cl. 123—210 **8 Claims**



1. An ignition device for a rotary piston engine having a rotor for defining a combustion and operation chamber with an engine housing and an attachment mounting bore formed in said engine housing to communicate with said operation chamber, comprising:

a glow plug for igniting air-fuel mixture in said operation chamber; and

an attachment means detachably mounted in said mounting bore, that end of said attachment means which is farther from said operation chamber having a mounting portion to mount said glow plug thereon, that side of said attachment means which faces said operation chamber having a cavity for defining an ignition port for said glow plug, that end of said attachment means which faces said operation chamber having a communicating port having a smaller aperture area than a cross-sectional area of said ignition port a longitudinal axis of said attachment means being on a plane perpendicular to an axis of rotation of said rotor, and also being slanted to a normal line drawn at the position of opening to an inner wall of said engine housing, toward the direction of rotation of said rotor;

whereby said glow plug ignites said air-fuel mixture through said communicating port.

4,202,313

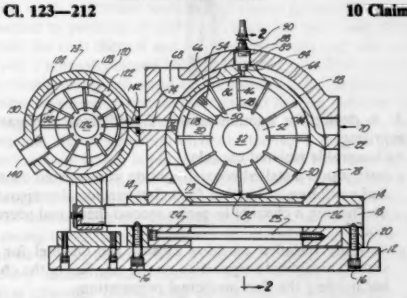
ROTARY ENGINE

Oscar E. Rosaen, 51 Roslyn Rd., Grosse Pointe, Mich. 48236

Filed Aug. 29, 1977, Ser. No. 828,299

Int. Cl.² F02B *53/08*

U.S. Cl. 123—212 **10 Claims**



1. An internal combustion engine comprising:

an annular open ended housing,

a wall portion in said housing which forms an ellipsoidal chamber,
a rotatably mounted drive shaft which extends transversely through said chamber,
a substantially cylindrical rotor disposed within said chamber and secured to said shaft, said rotor having a plurality of circumferentially equidistantly spaced vane members radially slidably disposed in said rotor,
means for urging said vane members radially outwardly so that said vane members sealingly engage selected sections of said wall portion,
fuel supply means for supplying fuel to said chamber,
fuel ignition means for igniting said fuel,
cooling fin members fixed to said rotor and extending substantially entirely exteriorly of said housing so that substantially all of the area of said cooling fin members is in constant fluid communication with a cooling fluid, and
wherein said cooling fin members comprise a first rotating plate and a second rotating plate fixedly secured to opposite sides of said rotor and rotatable therewith, and each of said plates having angularly spaced apart cooling fins secured thereto, said first and second plates cooperating to substantially enclose the ends of said annular housing therebetween.

4,202,314

DEVICE FOR INJECTION OF MEDICINAL PREPARATIONS

Boris A. Smirnov, ulitsa Borisa Galushkina, 17, kv.26, Moscow; Valery P. Busygin, Zheleznodorozhny proezd, 13, kv. 25, Moskovskaya Oblast, Krasnogorsk; Lidia S. Komina, Yaroslavskoe shosse, 127, kv. 30, Moscow; Vyacheslav N. Mochalov, Prospekt Mira, 122, kv. 174, Moscow; Lev V. Shagalov, Malaya Schukinskaya ulitsa, 15, kv. 89, Moscow, and Evgeny A. Gruzdev, ulitsa Gabricheskogo, 4, kv. 49, Moscow, all of U.S.S.R.

Filed Nov. 20, 1978, Ser. No. 962,204
Int. Cl.[2] A61M *5/00*
U.S. Cl. 128—218 F **1 Claim**

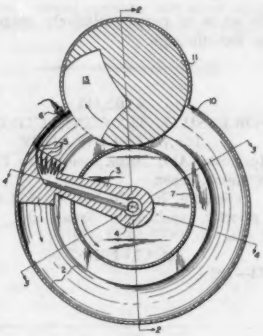
1. A device for administration of medicinal preparations comprising:
a changeable isolated capsule;
a main piston installed coaxially inside said isolated capsule, and confining a chamber for a first medicinal preparation and having a channel to pass a second medicinal preparation;
a movably installed partition closing the channel for the second medicinal preparation on the side facing the chamber holding the first medicinal preparation;
an additional piston installed in the channel of said main piston, confining the chamber for the second medicinal preparation;
an injection needle installed inside said changeable isolated capsule fixed on said additional piston, passing through said partition and having an aperture in the zone of said partition;
a housing upon which the changeable isolated capsule is installed;
a drive of the pistons, installed in said housing;
a spring-loaded pusher of said drive of the pistons, interacting with said main piston;
an additional spring-loaded pusher of said drive of the pistons, interacting with said additional piston and arranged coaxially with said spring-loaded pusher;
a stopping member, in said housing for the spring-loaded pusher; and
an additional stopping member installed in the housing for said additional spring-loaded pusher.

4,202,315

SINGLE CYCLE ROTARY ENGINE WITH CONSTANT FUEL FEEDING

Jacques Lutrat, 58, rue de Lorraine, Beaune, France (21200)

Continuation-in-part of Ser. No. 655,361, Mar. 10, 1976, abandoned. This application Mar. 20, 1978, Ser. No. 888,121
Int. Cl.[2] F02B *53/00*
U.S. Cl. 123—249 **10 Claims**



1. A rotary engine of the internal combustion type having constant fuel feeding comprising:
(A) a housing defining an outer annular chamber having an outer wall and an inner wall and adapted for explosion and expulsion of fuel, said annular chamber further including:
i. an ignition mechanism;
ii. an expulsion port peripherally spaced from said ignition mechanism;
iii. an open neck guide extending radially inward from said chamber;
(B) a hollow drive shaft extending transversely through said housing;
(C) a rotating cylindrical drum supported upon said drive shaft within said housing and defining an inner core thereof, said cylindrical drum sealingly engaging the inner wall of said annular chamber and said open neck guide;
(D) a piston rod attached to said drive shaft and extending radially through said cylindrical drum and said open neck guide, such that its outer end defines a rotatable piston head engaging the outer and inner walls of said annular chamber during a rotation through its circular cycle and including a fuel and air passage extending centrally through said rod and through a posterior side of said piston head;
(E) a moving seal interposed between said ignition mechanism and said expulsion port, said moving seal being of the rotary type mounted upon a shaft supported in said housing and rotatingly engageable with said cyclindrical drum, said moving seal including a complementary recess engag-

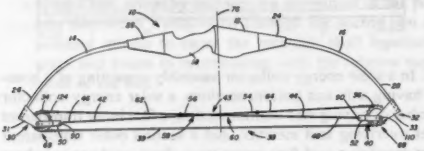
ing said piston head during a rotation of its circular cycle intermediate said expulsion port and said ignition point; and

(F) a source of pressurization and an unobstructed means continuously feeding separately fuel and air through said hollow shaft and said piston rod and piston head and into said chamber.

4,202,316
COMPOUND BOW

Alex J. Barna, 1216 Crawford St., Duquesne, Pa. 15110

Filed Jul. 3, 1978, Ser. No. 921,314
Int. Cl.[2] F41B *5/00*
U.S. Cl. 124—24 R **13 Claims**



1. A compound bow for propelling an arrow comprising,

handle means for gripping the bow,

a first limb and a second limb connected to opposite ends of said handle means and being operable to store energy to propel an arrow,

said first and second limbs and said handle means having a longitudinal axis extending the length of the bow,

a first pulley and a second pulley,

a first mounting assembly for rotatably and eccentrically positioning said first pulley on said free end portion of said first limb,

a second mounting assembly for rotatably and eccentrically positioning said second pulley on said free end portion of said second limb,

continuous cable means for flexing said first and second limbs,

said continuous cable means having a first end portion attached to said first mounting assembly and a second end portion attached to said second mounting assembly,

said continuous cable means including a flexible portion and a rigid portion,

said flexible portion being reeved about said first and second pulleys and extending therebetween to receive an arrow,

said flexible and rigid portions being aligned with said longitudinal axis,

said rigid portions including a pair of overlying rigid sections, and

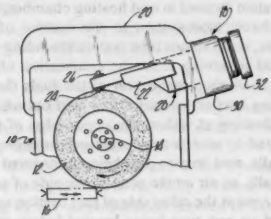
said pair of overlying rigid sections each having an intermediate portion deflected laterally from said longitudinal axis to prevent contact between said continuous cable means rigid portion, and an arrow when an arrow is released from the bow.

4,202,317
GRINDING WHEEL DRESSER

Anthony Kushigian, P.O. Box 768, Hendersonville, N.C. 28739

Filed Mar. 31, 1978, Ser. No. 892,208
Int. Cl.[2] B24B *53/02*
U.S. Cl. 125—11 H **5 Claims**

1. A grinding wheel dresser comprising a housing, an arbor carried by said housing for rotation with respect to said housing about an axis, an arm pivotly mounted on said arbor for rotation about an axis extending generally transverse to said axis of rotation of said arbor, having a free end extending beyond said arbor, and being constructed and arranged when rotated to move a dressing tool carried by said arm adjacent said free end thereof in a path generally transverse to said axis of rotation of said arbor, a pair of abutments on said arm located on opposite sides of said axis of rotation of said arm, a pair of cylinders each within said arbor, a fluid actuated piston slidably received in each of said cylinders, a plunger operatively associated with each piston and one of said abutments on said arm and constructed and arranged to rotate said arm with

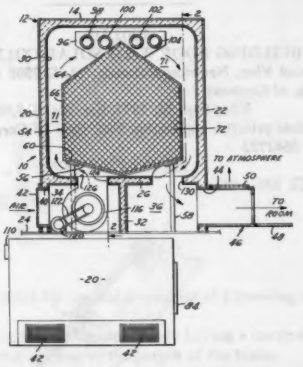


respect to said arbor when fluid is admitted under pressure to one of said cylinders so as to move the dressing tool carried by said arm along an arcuate path generally transverse to said axis of said arbor, said axis of rotation of said arm lying between and extending generally transverse to the paths of reciprocal movement of said pistons and plungers.

4,202,318
HEATING APPARATUS

Thomas C. DePodesta, 24145 Colonial Dr., Woodhaven, Mich. 48183, and Milton Moss, 30730 Hunter Dr., Farmington Hills, Mich. 48024

Filed Mar. 29, 1978, Ser. No. 891,424
Int. Cl.[2] F24H *3/02*
U.S. Cl. 126—110 R **15 Claims**



1. A heating apparatus comprising an insulated elongated housing having a top wall, a front wall, a back wall and a pair of side walls, a bottom wall spaced above ground level and connected to portions of said front, back and side walls intermediate the ends thereof and defining therewith and with said top wall a normally closed heating chamber, a hollow substantially closed elongated metal casing forming a fuel combustion chamber and fixedly mounted within said heating chamber for burning combustible solid fuels and/or gas or liquid fuels, said casing and said combustion chamber having a longitudinally extending axis which is perpendicular to said front and back walls of said housing, said combustion chamber casing extending lengthwise in said housing from said back wall to said front wall of said housing and abutting same, said combustion chamber casing being spaced from said top and side walls and from portions of said bottom wall to define an air circulating passageway in said heating chamber which surrounds said combustion chamber casing, said air circulating passageway extending from said back wall to said front wall of the housing, said combustion chamber being divided into a solid fuel burning zone and into a gas or liquid fuel burning zone, an insulated charge door carried by said front wall and through which solid

fuels are introduced into the interior of said combustion chamber, a gas or liquid fuel burner assembly carried by said back wall for introducing fuel and air into said gas or liquid fuel burning zone of said combustion chamber, a smoke exhaust tube system located in said heating chamber, means connecting said exhaust tube system to the interior of said combustion chamber, said exhaust tube system extending through said back wall and removing from the combustion chamber smoke resulting from the combustion of the fuels therein, a vertically extending barrier located below and outside of said normally closed heating chamber, the upper edge of said barrier being connected to said bottom wall and extending parallel to said side walls, said barrier also being connected to said front and back walls, an air intake zone at one side of said barrier and an air exit zone at the other side of said barrier, said air intake zone and said air exit zone being located below and outside of said normally closed heating chamber, air supply blower means in said air intake zone, an air inlet passage provided in said bottom wall between said air intake zone and one end of said air circulating passageway located in said heating chamber, said blower means having its discharge side located adjacent said air inlet passage, an air return passage in said bottom wall between the other end of said air circulating passageway and said air exit zone, said blower means transmitting air from said air intake zone into said heating chamber and directing the air through said air circulating passageway across said combustion chamber casing to pick up the heat radiating therefrom, with the heated air exiting said air circulating passageway through said air return passage which discharges into said air exit zone from where the heated air may be directed to atmosphere or to an air supply system.

4,202,319

BUILDING ROOF WITH SOLAR COLLECTOR

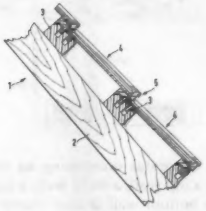
Siegfried Vinz, Neuwiesenrebenstr. 44, D-7505 Ettlingen, Fed. Rep. of Germany

Filed Sep. 23, 1977, Ser. No. 835,963

Claims priority, application Fed. Rep. of Germany, Sep. 23, 1976, 2642732

Int. Cl.[2] F24J *3/02*

U.S. Cl. 126—432 **17 Claims**



1. A building roof which includes a support structure, roof tiles, and roof battens disposed on the support structure for mounting the roof tiles, the roof tiles including a cavity and a solar collector means arranged in the cavity adapted to be traversed by a heat carrier medium, characterized in that the solar collector means further includes inlet means and outlet means for conveying the heat carrier medium to and from the solar collector means, channel means are provided in each roof batten for delivering the heat carrier medium to the inlet means and receiving the heat carrier medium from the outlet means of the solar collector means, said channel means including a portion extending parallel to the inlet means and outlet means of the solar collector means, each roof tile having a supporting area for supporting the same at the roof batten, and in that the inlet means and outlet means for the solar collector means are disposed in the supporting area and are adapted to be joined with the channel means of the roof battens.

4,202,320

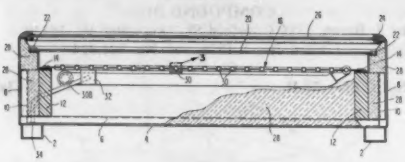
SOLAR ENERGY COLLECTOR ASSEMBLY

John C. Bowen, Huntingdon Valley, Pa., assignor to Ametek, Inc., Paoli, Pa.

Continuation-in-part of Ser. No. 654,407, Feb. 2, 1976, abandoned. This application Oct. 31, 1977, Ser. No. 847,250

Int. Cl.[2] F24J *3/02*

U.S. Cl. 126—447 **13 Claims**



1. In a solar energy collector assembly consisting of a housing having side and bottom sections, a solar energy collector member overlying said bottom section, a first inner transparent sheet overlying said member, and a second outer transparent sheet overlying said first transparent sheet, said second sheet being attached to said side housing sections and forming with said side and bottom sections an enclosure for said assembly, the improvement wherein said first transparent sheet and said energy collector member are thermally insulated from and spaced from the side and bottom housing sections and the second transparent sheet, a plurality of low thermal conductivity projections extending from said housing inwardly, said collector member and said first inner transparent sheet contacting and being supported by said projections at spaced locations about the periphery thereof, the space to the side and below said collector member and surrounding said projections being filled with thermal insulation material.

4,202,321

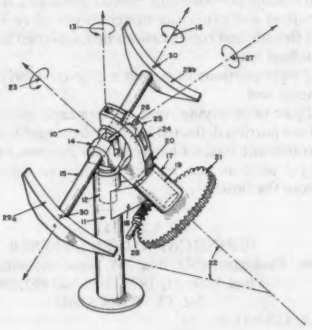
SOLAR TRACKING DEVICE

William M. Volna, 3501 Coolidge St., N.E., Minneapolis, Minn. 55418

Filed May 30, 1978, Ser. No. 910,669

Int. Cl.[2] F24J *3/02*

U.S. Cl. 126—425 **13 Claims**



1. An apparatus for tracking the relative position of the sun from a location latitudinally and longitudinally fixed within the earth's temperate zones, comprising

(a) a base having a support axis member affixed thereto;

(b) means for aligning said support axis member along a first line which is vertical relative to the center of the earth;

(c) a movable polar axis member attached to said base;

(d) means for aligning said polar axis member in parallel relationship to the earth's celestial pole and along a second line passing through said first line;

(e) a rotatable shaft member having its axis of rotation passing through the intersection of said first and second lines, said shaft member being pivotable in a horizontal plane about said intersection;

(f) a sector arm attached to said polar axis member and axially rotatable therewith, said sector arm having a curved portion defined by a constant radius from the point of intersection of said first and second lines;

(g) a pointing spindle rigidly attached to said rotatable shaft member in radial alignment from said intersection of said first and second lines, and movably connected to said sector arm curved portion;

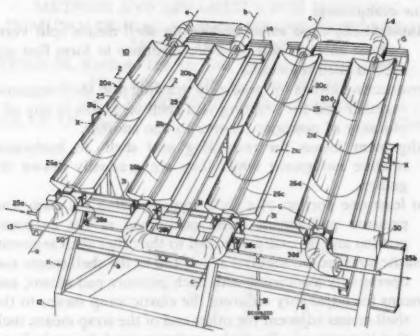
(h) constant speed drive means, coupled to said polar axis member, for turning said polar axis member about said second line; whereby said turning movement of the polar axis member is transformed through the sector arm and pointing spindle to cause the rotatable shaft member to pivot and rotate in synchronism with the relative movement of the sun.

4,202,322

SOLAR ENERGY COLLECTOR AND HEAT EXCHANGER

Manuel M. Delgado, La Mirada, and Harold N. Riise, La Canada, both of Calif., assignors to Del Manufacturing Company, Monterey Park, Calif.

Filed May 11, 1977, Ser. No. 795,947
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—425 **21 Claims**



1. A solar energy collection system comprising an elongated collector dimensioned to concentrate solar flux into a concentrated linear region;

a fixed receiver tube extending along said region;

means mounting said collector for rotation about an axis located in said region;

means for powering the rotation of said collector to keep solar image on the receiver tube;

means supplying said receiver tube with a source of heat exchange medium;

outlet means for receiving the heat exchange medium after passage through said receiver tube; and

transparent means encircling said receiver tube for isolating said receiver tube from air currents in the region of said collector and receiver tube: wherein said means for powering said collector is operative to drive said collector through a 360 degree rotation.

4,202,323

DRUG ACTIVATION BY RADIATION

Jack Zweig, 145 Vaneck Dr., New Rochelle, N.Y. 10804; William McLaughlin, 3901 Albemarle St., NW., Washington, D.C. 20016, and Matthew L. Herz, 20 Swanson Rd., Framingham, Mass. 01701

Filed Apr. 28, 1978, Ser. No. 900,897
Int. Cl.[2] A61K *29/00*; A61B *10/00*
U.S. Cl. 128—1.1 **12 Claims**

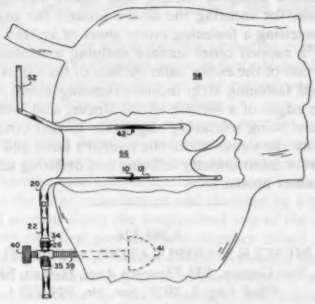
1. A method of selectively causing drug activation in a localized area within a living body which comprises administering to said body a substituted aminotriarylacetonitrile capable of undergoing radiation induced cleavage to form a substituted aminotriarylmethyl component and a free cyanide component, said nitrile being soluble in the body serum so that it is capable of passing by the administration thereof to said body, and then subjecting a localized area to radiation capable of causing cleavage of said cyanide species from said nitrile in said localized area, said cyanide ion and/or carbocation acting as a radiation sensitizer in said localized area.

4,202,324

EQUINE VAGINAL SPECULUM

W. Evans Alison, Rte. 1, Brownsboro, Ala. 35741

Filed Mar. 30, 1978, Ser. No. 891,524
Int. Cl.[2] A61B *17/02*
U.S. Cl. 128—20 **5 Claims**



1. An instrument for vaginal inspection of a standing animal comprising:

a generally straight, elongated blade having a curve-shaped cross section normal to the length of the blade;

an elongated generally straight arm extending generally at a right angle from an end of said blade;

an elongated generally straight shaft extending from said arm generally parallel to and spaced from and directly under said blade;

a weight;

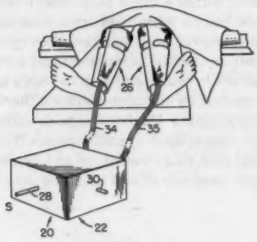
means for supporting said weight on said shaft, means for adjusting the distance between said weight and said arm along the line defined by the axis of said shaft,

the combination of said shaft and weight being configured with an overall width approximately no greater than the width of said blade, whereby the shaft and weight may readily extend between the legs of a standing animal; and

the combination of said blade, arm, and weight being freely suspendable from the vagina of a standing animal;

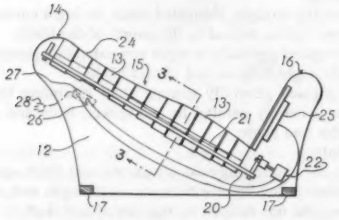
whereby, when said elongated blade is inserted vaginally and generally horizontally in a standing animal, said weight member will freely cause a generally downward force to be applied to the underside of the blade at points of engagement of the blade along the length of the blade with the animal.

4,202,325
COMPRESSION DEVICE WITH IMPROVED FASTENING SLEEVE
Frank K. Villari, Oak Park; Norbert W. Ellmann, Lake Zurich, and Larry D. Annis, Elgin, all of Ill., assignors to The Kendall Company, Boston, Mass.
Filed Jan. 12, 1979, Ser. No. 2,824
Int. Cl.[2] A61H *1/00*
U.S. Cl. 128—24 R **7 Claims**



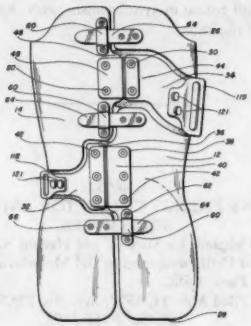
1. A device for applying compressive pressures against a patient's limb from a source of pressurized fluid, comprising:
an elongated pressure sleeve for enclosing a length of the patient's limb, said sleeve having a pair of side edges, a pair of end edges connecting the side edges, and fluid pressure chamber means, said sleeve having fastening means for securing the sleeve around the patient's limb comprising a fastening cover sheet of knitted fabric having a napped outer surface defining a substantial major portion of the entire outer surface of the sleeve, and elongated fastening strip means extending along one of said side edges of a surface of the sleeve, said fastening strip means being releasably engagable to said cover sheet to secure the sleeve about the patient's limb; and
means for intermittently inflating and deflating said pressure chamber means.

4,202,326
MUSCLE MANIPULATING APPARATUS
Gary W. Van Gerpen, 833 Eleventh Ave., Helena, Mont. 59601
Filed Aug. 1, 1978, Ser. No. 929,923
Int. Cl.[2] A61H *1/00*
U.S. Cl. 128—33 **7 Claims**



1. Muscle manipulating apparatus including a frame having spaced end members disposed substantially parallel to each other, a plurality of crossmembers extending between said end members, each of said crossmembers having a recess in the undersurface thereof, said crossmembers being disposed in a parallel relationship adjoining each other to form a substantially continuous surface, each of said crossmembers being supported for movement in a longitudinal plane through said crossmember which is substantially perpendicular to its portion of said continuous surface, means for sequentially moving each of said crossmembers including a rotatable cam shaft positioned behind said crossmembers and in direct contact with said recesses in the undersurface of said crossmembers, said cam shaft being disposed substantially perpendicular to the longitudinal axes of said crossmembers, said cam shaft having a plurality of cam surfaces equal in number to that of said crossmembers, each of said cam surfaces being disposed adjacent to one of said crossmembers and engageable therewith, and drive means for rotating said cam shaft and said cam surface thereon to provide cyclical movement of said crossmembers.

4,202,327
DYNAMIC ORTHOTIC DEVICE
John J. Glancy, 6280 Dean Rd., Indianapolis, Ind. 46220
Filed May 24, 1978, Ser. No. 908,967
Int. Cl.[2] A61F *5/02*
U.S. Cl. 128—78 **8 Claims**



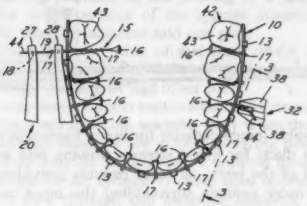
1. A dynamic orthosis device adapted for application to the torso of a human patient with an abnormal curvature of the spine comprising:
substantially rigid torso-enveloping shell means split vertically at anterior and posterior positions to form first and second shell segments;
connecting means for gradually drawing said shell segments together and for securing said shell segments in any of a plurality of positions relative to one another,
alignment means for restricting said shells to horizontal relative movement while they are gradually drawn together,
at least one portion of a shell segment being cut-away and pressure pad means being positioned in the cut-away portion and pivotally attached to the other shell segment;
elastic strap means secured at one end to the shell means and operatively associated with each pressure pad means; and
means for adjustably securing the elastic strap means to the shell means adjacent the other end of the strap means such that it exerts an adjustably predetermined dynamic force on its associated pressure pad means;
whereby the elastic means causes the pressure pad means to apply adjustable predetermined dynamic forces to the patient's torso in order to correct abnormal curvatures of the patient's spine.

4,202,328
METHOD AND MEANS FOR FIXATION AND IMMOBILIZATION OF THE JAWS
Ghassan A. Sukkarie, 32037 Concord Dr., Madison Heights, Mich. 48071
Filed Nov. 23, 1977, Ser. No. 854,272
Int. Cl.[2] A61F *5/04*
U.S. Cl. 128—89 A **10 Claims**

1. An oral surgery treatment assembly for the immobilization of a patient's jaws, comprising in combination:
(a) a pair of elongated arch bars which each have a plurality

of openings therethrough, with each of said openings having a plurality of slits formed around the outer periphery thereof, and each arch bar having a plurality of outwardly extended hooks, and each arch bar being suitable for mounting around the periphery of one jaw of a patient;

(b) a plurality of arch wires, which each have a retainer member on a first end and a plurality of beads spaced along the length of the wire, for insertion in the mouth of a patient, and for disposal adjacent one or more teeth on each jaw in a patient's mouth, and wherein a second end of



each of the arch wires is inserted through one of said plurality of openings through one of the arch bars, and retained in engagement therewith by one of the beads on the arch wire passing through one of said openings, which expand due to said slits to allow passage of a bead, and being seated against the outer face of the arch bar and an adjacent bead being seated against the inner face of the arch bar; and,

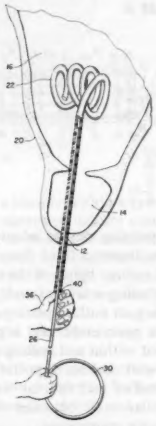
(c) a retainer member is mounted between adjacent opposed pairs of hooks on said jaws for fixing said pair of arch bars together and immobilizing the jaws.

4,202,329

METHOD AND APPARATUS FOR INDUCING IMMUNOLOGICAL AND RESISTANT RESPONSE IN MAMMARY GLANDS

William M. Kortum, 180 Ely Rd., Petaluma, Calif. 94952

Filed May 5, 1978, Ser. No. 903,343
Int. Cl.[2] A61F *5/46*; A01J *3/00, 5/00*
U.S. Cl. 128—130 **7 Claims**



1. A method for inhibiting bacterial infection without significantly degrading milk quality in the udder of a host susceptible to bacterial infection which comprises:

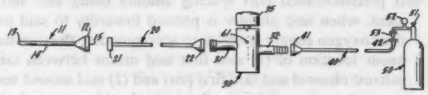
introducing into at least one gland cistern of said udder a non-toxic nonspecific antigenic device of a sufficient size to be restrained from entering the teat cistern of said udder.

4,202,330

LIFE SUPPORT SYSTEM AND VALVE FOR USE THEREWITH

Daniel S. Jariabka, 1998 Big Oak La., Northbrook, Ill. 60062

Filed Jun. 26, 1978, Ser. No. 919,072
Int. Cl.[2] A61M *16/00*
U.S. Cl. 128—204.18 **3 Claims**



1. In a life support system for use in performing an emergency tracheostomy on a patient, including a manually operable, small, portable valve connected between a first conduit means and a second conduit means where said first conduit means is further connected to insertion means for being inserted into the throat region of the patient and for passing gas therethrough and where said second conduit means is further connected to a supply of oxygen; the improvement comprising:

said valve including a housing having an interior surface defining a chamber therein oriented about a longitudinal axis and having an open end communicating with the exterior of said housing and a closed end opposite said open end;

said housing defining a first port for providing communication between said chamber and said first conduit for alternately passing oxygen flow to said patient and passing expiration air flow from said patient;

said housing further defining a second port for providing communication between said chamber and said second conduit for passing oxygen from said oxygen supply to said chamber, said second port being spaced from said first port at the interior surface of said chamber by a predetermined amount along the longitudinal axis of the chamber between said first port and said chamber closed end;

said housing further defining a patient expiration air exhaust channel communicating between the exterior of said housing and said chamber and terminating in an exhaust aperture in said chamber located between said chamber open end and said first port;

said housing further defining an oxygen drain channel communicating between the exterior of said housing and said chamber and terminating in a drain aperture in said chamber located between the closed end of said chamber and said second port;

a plunger slidably disposed within said chamber for movement between a patient air expiration position and a patient oxygen supply position, said plunger including spaced-apart first and second seal means for sealing between said plunger and the interior surface of said chamber, said first and second seal means defining them a central flow passageway in said valve, said second seal means being disposed between said first seal means and the closed end of said chamber for defining an end flow passageway in said valve adjacent said central flow passageway;

spring means disposed within said chamber at the closed end thereof for urging said plunger outwardly through said open end of said chamber to said patient oxygen supply position;

stop means mounted in said housing for limiting at least the outward movement of said plunger under the influence of said spring;

said predetermined port spacing amount being sufficient to accommodate the simultaneous location of (1) said first seal means between said exhaust channel aperture and said

chamber open end and (2) said second seal means between the first and second ports when the plunger is biased to the patient air expiration position whereby oxygen flowing into said valve second port and accumulating in said closed end of said chamber can leak out of said end flow passageway through said oxygen drain channel and whereby the expiration of air from the patient can flow sequentially through said insertion means, through said first conduit and first port, through said central passageway, and out of said valve through said exhaust channel; and

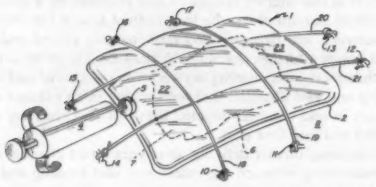
said predetermined port spacing amount being also sufficient, when said plunger is pressed inwardly to said patient oxygen supply position, to accommodate the simultaneous location of (1) said first seal means between said exhaust channel and said first port and (2) said second seal means between said second port and said oxygen drain channel whereby oxygen from said oxygen supply can flow sequentially through said second conduit and second port, through said central passageway, out of said valve through said first port, through said first conduit, and finally through said insertion means into said patient.

4,202,331

SKIN GRAFT PRESSURE PAD

William S. Yale, 215 E. Chicago, Chicago, Ill. 60611

Filed Aug. 3, 1977, Ser. No. 821,621
Int. Cl.[2] A61F *13/00*
U.S. Cl. 128—155 **19 Claims**



1. A skin graft pressure pad comprising in operative combination:

(a) means defining an enclosure for a liquid mass comprising a soft, easily deformable, transparent plastic bag and having a property of low adherence to tissue or serous fluids on at least one skin graft contact surface thereof;

(b) said enclosure means being pliable, freely conformable to variations in surface contour, and non-freestanding;

(c) at least one substantially transparent liquid disposed in said enclosure in an amount to at least partially fill said enclosure to permit said free surface conformability;

(d) the volume of said enclosure and amount of said liquid being selectable to provide mass sufficient to enhance growth-promoting contact between grafted tissue and underlying tissue without substantial tissue necrosis;

(e) means for removably securing said enclosure containing said liquid in contact with said graft tissue; and

(f) said securing means being adapted to retain said pad in a predetermined position in direct continuous contact with said graft tissue to permit said liquid to transmit substantially uniform, growth-promoting pressure to said graft tissue without inducing substantial tissue necrosis.

4,202,332

DOUBLE LUMEN CATHETER

Bernd Tersteegen, and Günter Van Endert, both of Kreuzstrasse 19, D-4000, Düsseldorf, Fed. Rep. of Germany

Filed Jan. 5, 1978, Ser. No. 867,181
Claims priority, application Fed. Rep. of Germany, Jan. 26, 1977, 2703087
Int. Cl.[2] A61M *5/00, 25/00*
U.S. Cl. 128—214.4 **9 Claims**

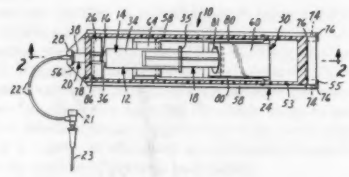
1. A double lumen catheter for use in haemodialysis, which comprises ducts for blood streams flowing into and respectively out of the body, an inner cannula providing an inner duct, an outer cannula surrounding the inner cannula and providing between the inner cannula and the outer cannula an outer duct, said outer cannula including a smooth and continuous outer surface defined by an imperforate wall, a front end of at least the inner cannula being inclined obliquely to the longitudinal cannula axis and sharply ground to facilitate puncture of a blood vessel, the front end of the inner cannula projecting beyond a front end of the outer cannula and defining an axially open passage of said inner duct, the cross-section of the catheter changing progressively from the outer diameter of the inner cannula to the outer diameter of the outer cannula, the outer duct when in an operative state having at its front end an axially open passage of cross-sectional area equal to the cross-sectional area of the outer duct, so that the total cross-section of the outer duct is available to a blood stream entering or leaving the outer duct.

4,202,333

FLUID DISPENSING DEVICE

Gary A. Thill, St. Paul, Minn., and Jerome E. Strand, St. Joseph Township, St. Croix County, Wis., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 8, 1978, Ser. No. 958,678
Int. Cl.[2] A61M *5/00*
U.S. Cl. 128—218 A **4 Claims**



1. A fluid dispensing device adapted for engaging a fluid-filled syringe to dispense fluid from the syringe at a slow, steady rate, said syringe being of the type comprising an elongate housing including a tubular wall having an open end and an end wall having an outlet opening at the end of the tubular wall opposite its open ends, and a plunger having one end portion positioned within and sealing against the inner surface of said tubular wall and an opposite end portion projecting from the open end of said tubular wall, with the fluid being within said tubular wall between said end wall and said plunger, said device comprising:

a metering assembly including a first part having an outer wall and a transverse wall defining chambers within said first part on opposite sides of said transverse wall, said transverse wall having an orifice communicating between said chambers; a capillary tube extending through said

transverse wall and a second part having a through opening and a portion sealably and movably mounted within the outer wall of said first part for movement relative to said first part between a purging position with said portion spaced from said orifice so that fluid can flow between said chambers through said orifice, and a metering position with said portion blocking said orifice so that fluid can pass said transverse wall only through said capillary tube;

means adapted for releasably attaching one of said parts of the metering assembly to the housing of a said syringe with the outlet opening of the syringe communicating with the chamber adjacent said one part;

a hose attached to the other of said parts of the metering assembly with the bore of the hose communicating with the through opening of said other part;

a frame comprising support means adapted for engaging and supporting said metering assembly only when the parts of said metering assembly are in their metering position;

spring means adapted for applying a uniform force against the plunger of the syringe to cause fluid within said syringe to flow through said metering assembly into said hose; and

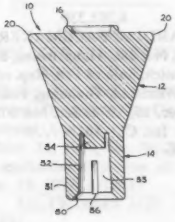
activating means for moving said spring means between a disengaged position spaced from the plunger of a said syringe attached to said metering assembly to afford insertion or removal of the syringe and said metering assembly, and an engaged position engaged with said plunger to apply said uniform force, said activating means including securing means for securing the syringe and the metering assembly in said support means when said activating means positions said spring means in said engaged position.

4,202,334

CAP AND STOPPER

Edward E. Elson, Anaheim, Calif., assignor to C. R. Bard, Inc., Murray Hill, N.J.

Filed Feb. 28, 1978, Ser. No. 882,233
Int. Cl.[2] A61J *1/00*
U.S. Cl. 128—272 **7 Claims**



1. A device for sealing a sample within a syringe comprising a cap means and stopper means of unitary construction:

said cap means having an interior frustoconical wall and an exterior cylindrical wall, a closed end and a mouth, said interior wall configured to engage an exterior wall of said syringe as said syringe and cap means are joined together;

said cap means being provided with a first means for allowing air to escape from the cap during insertion of said syringe into said cap means;

said cap means being further provided with a second means for forming a seal with an interior wall of the syringe as the syringe approaches the closed end of said cap means; and

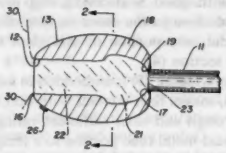
said stopper means having a base integrally joined to said cap means and a plurality of generally flat surfaces extending radially outward on said stopper means adjacent said base, said stopper means configured such that the syringe is substantially prevented from rolling about its axis on a flat surface when said device is joined thereto, and wherein the cross-sectional area of said stopper means adjacent said base is greater than the cross-sectional area of said cap means.

4,202,335

EXTERNAL CATHETER DRAINAGE DEVICE

Lawrence W. Gold, 1286 Larch Ave., Moraga, Calif. 94556

Filed Feb. 23, 1978, Ser. No. 880,693
Int. Cl.[2] A61F *5/44*
U.S. Cl. 128—295 **9 Claims**



1. An external catheter drainage device dimensioned to fit over and surround the penile glans of the user and to extend over the penile shaft of the user, and a drainage tube therefor; said device comprising:

a pair of elongated inner and outer coterminous impervious members extending substantially over the full length of said device and joined at their opposite ends to define a continuous air chamber therebetween over the length of said device, said members being joined at one end directly at and to one end of said tube with said air chamber contiguous to and extending longitudinally from said tube end and with said tube in registration with the interior of said inner member;

said inner member being formed of a thin flexible sheet having a thinness and flexibility such as to lay in substantially continuous contact with the exterior contours of the penile glans and shaft and being dimensioned together with said air chamber to surround and closely conform to the peripheral shape of the penile glans and shaft; and

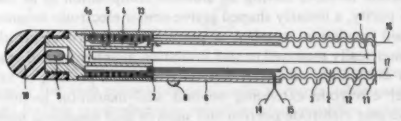
said chamber being formed for pressurizing to thereby apply a substantially uniform encapsulating pressure on the exterior of the penile glans and shaft and to anchor said tube end in substantial abutment and in registration with the urethral meatus.

4,202,336

CAUTERIZING PROBES FOR CRYOSURGERY

Hans van Gerven, Tübingen, Fed. Rep. of Germany, assignor to Erbe Elektromedizin KG, Tübingen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 793,778, May 5, 1977, abandoned. This application Jan. 3, 1978, Ser. No. 866,705
Claims priority, application Fed. Rep. of Germany, May 14, 1976, 2621553; Aug. 10, 1977, 2736113
Int. Cl.[2] A61B *17/36*
U.S. Cl. 128—303.1 **10 Claims**



1. A surgical probe comprising a hollow tubular shaft having a metal tube portion forming an outer wall of the probe, said metal tube portion having an end region forming the end of said shaft and defining a cooling section of said probe, channels being provided within the shaft leading to and from said cooling section for circulation of a cooling medium, a tip connected

to the extremity of said end region of said metal tube shaft portion and containing a thermal sensor and an electrical heating winding mounted in said cooling section of said shaft for thawing frozen tissues, and connecting means in said shaft associated with said heating winding for its energization by an external source of electricity, said probe having the improvement wherein:

the probe is provided with a coating (7) at least on the outer surface of said cooling section (4) thereof consisting of elastic synthetic material that is stable up to 200° C. and has the property of preventing the sticking of flesh to the probe even during cauterization;

material with good heat-conducting properties in contact with and close to the inner surface of said end region of said metal tube portion of said shaft which defines said cooling section (4);

the heating winding (5) is embedded in said heat-conducting material, makes firm contact with said metal tube portion therethrough and is of sufficient rating to be capable of raising said metal tube portion to a temperature of at least 190° C. at a power of at least 100 watts for not less than a few seconds, so that after a cryosurgical operation, a cauterization of flesh tissues in the region of tissues previously frozen can thereby be carried out, and;

said channels connect with a cooling cavity in said cooling section which is adjacent to said tip.

4,202,337

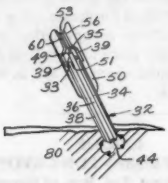
BIPOLAR ELECTROSURGICAL KNIFE

John J. Hren; David E. Clark; David A. Jenkins; Paul F. Johnson, III, all of Gainesville, and Howead E. Degler, Jr., St. Petersburg, all of Fla., assignors to Concept, Inc., Clearwater, Fla.

Continuation-in-part of Ser. No. 695,649, Jun. 14, 1976, abandoned. This application Jun. 14, 1977, Ser. No. 806,529

Int. Cl.[2] **A61B** *17/36;* **A61N** *3/02*

U.S. Cl. 128—303.14 **19 Claims**



1. An electrosurgical instrument of the type adapted to be selectively connected to a source of energy such as a high frequency electrical current for use in cutting, coagulating or otherwise treating human tissue or the like comprising an insulative handle and blade assembly mounted in said handle and extending therefrom, said blade assembly comprising an insulation member having an alumina composition of at least 96% purity, a linearly shaped active center electrode mounted to said insulation member, a plurality of return electrodes symmetrically mounted to said insulation member spaced apart from said center electrode and each other, a portion of said center electrode extending beyond said insulation member, said center electrode portion and sides of said insulation member forming a blade assembly having a beveled edge, means for connecting said electrodes to an energy source means so that an output circuit of a source of energy comprising a high frequency electrical current is completed through body tissue, said energy source means comprising means to selectively generate and conduct wave forms to said electrodes for performance of the desired electrical function.

4,202,338

DEVICE FOR REMOVING EXCRESCENCES AND POLYPS

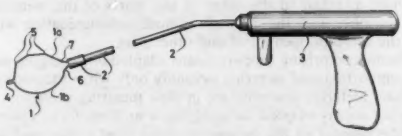
Ehrenfried Bitrolf, Bretten-Ruit, Fed. Rep. of Germany, assignor to Richard Wolf GmbH, Knittlengen, Fed. Rep. of Germany

Filed Nov. 13, 1978, Ser. No. 959,502

Claims priority, application Fed. Rep. of Germany, Nov. 18, 1977, 7735281[U]

Int. Cl.[2] **A61B** *17/32;* **A61N** *3/00*

U.S. Cl. 128—303.15 **6 Claims**



1. A device for removing excrescenses and polyps in a body cavity, comprising:

(a) a tubular guide having proximal and distal ends,

(b) a resilient wire loop for fitting around an excrescense or polyp, at the distal end of the guide and of generally oval configuration in an expanded position thereof,

(c) an actuating handle at the proximal end of the guide connected to said loop, for moving said loop between said expanded position and a position in which said loop is retracted in the distal end of the guide, and

(d) means for connecting said loop to a voltage source,

(e) said loop having, as considered in its expanded position,

(i) a small bulge at one end,

(ii) two opposed sides extending from said bulge towards said distal end of the guide, of which one side is of generally arcuate form,

(iii) an inwardly kinked proximal portion in said one of said two sides, in front of the distal end of the guide, and

(iv) at least two outwardly pointing kinks in the the other of said two sides.

4,202,339

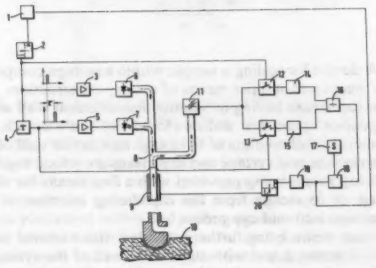
CARDIAC PACEMAKER

Alexander Wirtzfeld, No. 26b, Haupstrasse, 8191 Thanning, and Thomas Bock, Munich, both of Fed. Rep. of Germany, assignors to Alexander Wirtzfeld, Thanning, Fed. Rep. of Germany

Filed Dec. 19, 1978, Ser. No. 970,894

Int. Cl.[2] **A61N** *1/36*

U.S. Cl. 128—419 PG **9 Claims**



1. A cardiac pacemaker including means for conforming the stimulation frequency to the bodily stressing conditions of the wearer of the pacemaker in using a blood parameter as measuring value for the influencing of the frequency of stimulation, said cardiac pacemaker comprising a measuring pole implanted in the heart of the wearer of the pacemaker for measuring the oxygen saturation of the blood, the measuring value thereby

resulting serving as measuring parameter for the influencing of the frequency of stimulation.

4,202,340

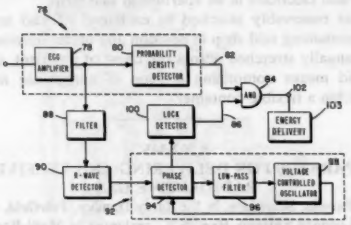
METHOD AND APPARATUS FOR MONITORING HEART ACTIVITY, DETECTING ABNORMALITIES, AND CARDIOVERTING A MALFUNCTIONING HEART

Alois A. Langer, Pittsburgh; Marlin S. Heilman, Gibsonia, both of Pa.; Morton M. Mower, Baltimore, Md., and Mieczyslaw Mirowski, 2405 Velvet Valley Way, Owings Mills, Md. 21117, assignors to Mieczyslaw Mirowski, Owings Mills, Md.

Division of Ser. No. 620,025, Sep. 30, 1975, abandoned. This application Feb. 15, 1978, Ser. No. 878,005

Int. Cl.[2] A61N *1/36*

U.S. Cl. 128—419 D **16 Claims**



1. A method for electronically monitoring the operation of a heart and for enabling the detection of abnormalities in cardiac function, the method comprising the steps of: sensing at least one cardiac parameter indicative of the operation of the heart being monitored; operating on the sensed cardiac parameter and generating a probability density function therefrom; and monitoring said probability density function by comparing the shape thereof with the shape of a probability density function indicative of normal cardiac function; wherein differences in shape between the normal probability density function and the probability density function generated from the heat being monitored, indicate abnormal cardiac function of the heart being monitored.

4,202,341

CARDIAC PACEMAKER CIRCUIT WITH VARIABLE OPERATION

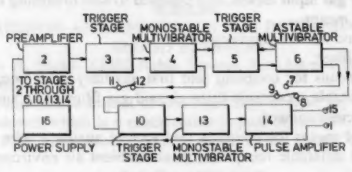
Reinhard Blaser, Berlin, Fed. Rep. of Germany, assignor to Biotronik Mess- und Therapiegeräte GmbH & Co., Berlin, Fed. Rep. of Germany

Filed Mar. 14, 1978, Ser. No. 886,396

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1977, 2712616; Mar. 19, 1977, 2712617

Int. Cl.[2] A61N *1/36*

U.S. Cl. 128—419 PG **26 Claims**



1. An artificial cardiac pacemaker circuit connected to operate selectively in either one of two different modes of operation, comprising:

electrode means implantable in the heart of a patient for receiving heart signals produced thereby and supplying heart stimulation pulse signals thereto;

a first pulse generator having an input connected to said electrode means for generating a pulse having a predetermined duration in response to each signal appearing at said electrode means; and

a second pulse generator including

an input connected to the output of said first pulse generator,

an output connected to said electrode means for supplying heart stimulation pulses thereto,

means defining a first signal path connected to actuate a signal at said output of said second pulse generator in response to the start of each output pulse produced by said first pulse generator, and to actuate a signal at said output of said second pulse generator at the end of a given interval during which no output pulse is produced by said first generator, the given interval being longer than the duration of each output pulse produced by said first generator,

means defining a second signal path connected to provide in response to each output pulse produced by said first pulse generator, a signal having a duration corresponding to the duration of said output pulse,

connection means connected between at least one of said signal paths and said output of said second pulse generator and connectable for establishing a selected one of a first connection configuration in which each signal appearing in said first signal path generates a heart stimulation pulse at said output of said second pulse generator, and a second connection configuration, and

signal responsive means connected to said connection means when said connection means is connected in said second connection configuration for preventing the appearance of a heart stimulation pulse at said output of said second pulse generator during the time when a signal is present in said second signal path.

4,202,342

PROGRAMMABLE PACER WITH VARIABLE AMPLIFIER SENSITIVITY AND PACING RATE

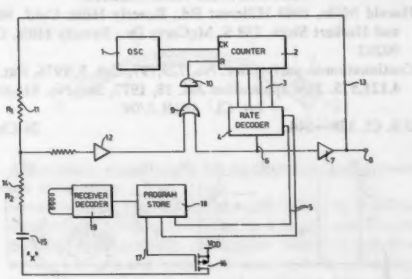
John W. Keller, Jr., Miami, Fla., assignor to Biotronik Mess- und Therapiegerate GmbH & Co., Berlin, Fed. Rep. of Germany

Filed Jun. 19, 1978, Ser. No. 917,142

Claims priority, application United Kingdom, Aug. 19, 1977, 34917/77

Int. Cl.[2] A61N *1/36*

U.S. Cl. 128—419 PG **2 Claims**



1. In a programmable pacer system having a remote source of pacer function programming signals, an implantable cardiac pacer having programmably variable input amplifier sensitivity comprising:

pulse generating means for periodically issuing stimulating pulses;

an input amplifier for sensing signals at the heart and for resetting said generating means in response to a sensed signal, wherein the improvement comprises local memory means producing an output signal, responsive to signals

from said remote source, a potential dividing network provided with an intermediate tap, means connecting said intermediate tap to the input of said amplifier, means connecting one extremity of said network to sense signals at the heart, and means connected to apply to the other extremity of said network a potential controlled by the output signal of said memory means for controlling the sensitivity of said input amplifier.

4,202,343

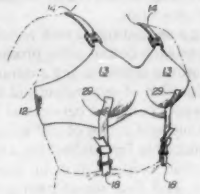
JOGGER'S BRASSIERE

David L. Ichelson, 155 Birch St., Redwood City, Calif. 94062

Filed May 15, 1978, Ser. No. 905,409

Int. Cl.[2] A41C *3/02*

U.S. Cl. 128—438 **3 Claims**



1. A brassiere for firmly holding the breasts during running, jumping or similar activities comprising:

a body encircling band having breast cup portions having undersurfaces under the breasts,

elastic shoulder straps secured to the breast cup portions, running over the wearer's shoulder, and anchored at the wearer's back, and

elastic midriff straps secured by sewing to the undersurfaces of said breast cup portions and extending from said band into said cup portions and extending down and attachable to a waist encircling garment, the midriff straps being used to exert pressure on the breast cup portions to urge the breasts downwardly, said straps having clips the waist encircling garment, the bands having snubbers and adjustment clips to allow tightening and loosening of the downward pressure on the breast cup portions.

4,202,344

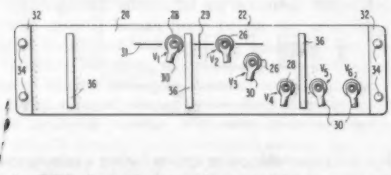
ELECTROCARDIOGRAPH ELECTRODES AND ASSOCIATED ASSEMBLIES

Harold Mills, 1049 Hillcrest Rd., Beverly Hills, Calif. 90210, and Herbert Stein, 238 S. McCarty Dr., Beverly Hills, Calif. 90212

Continuation-in-part of Ser. No. 729,797, Oct. 5, 1976, Pat. No. 4,121,575. This application Jul. 18, 1977, Ser. No. 816,643

Int. Cl.[2] A61B *5/04*

U.S. Cl. 128—644 **26 Claims**



1. An ECG electrode assembly comprising:

an elongated strip of stretchable nonconductive material having a plurality of apertures arranged in a predetermined pattern with the proportional spacing of the apertures corresponding to the proportional spacing of precordial positions for ECG monitoring;

means for resisting a reduction in the width of said strip as a result of the elongation of the strip under tension;

a plurality of electrodes each removably carried by said strip in one of said plurality of apertures, each of said electrodes comprising:

a hollow member having a portion made of an electrically conductive material, said member being flared at one end to engage the skin of the patient and being open at the other end so that an electrolyte can be inserted into the hollow of said member to establish a low resistance electrical connection between the skin of the patient and the conductive portion of said member;

a connector means electrically connected to the conductive portion of said member for establishing an electrical connection with the lead of an ECG machine without interfering with the insertion of electrolyte when connected to the lead of an ECG machine; and,

means carried by said member for removably retaining said electrode in an aperture in said strip;

means removably attached to each end of said strip for maintaining said strip in position and under tension when manually stretched across the chest of a patient, each of said means comprising a mass of aprticulate material within a flexible container.

4,202,345

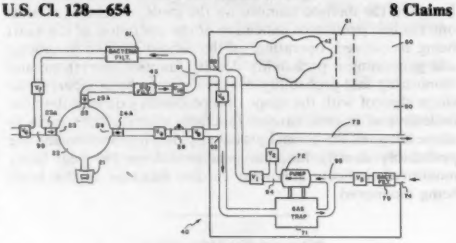
APPARATUS FOR DELIVERING AND RECEIVING RADIOACTIVE GAS

Ralph Farella, Scarsdale, N.Y.; Barry Dansky, Fairfield, Conn., and Leonard Epifano, Rye, N.Y., assignors to Medi-Ray, Inc., Tuckahoe, N.Y.

Filed Dec. 9, 1977, Ser. No. 859,028

Int. Cl.[2] A61B *6/00*

U.S. Cl. 128—654 **8 Claims**



1. Apparatus for delivering and receiving gas to and from a patient comprising, in combination:

restrictive breathing chamber means adapted for coupling to the patient's breathing organs;

an inflatable receptacle;

means including a first check valve for coupling said breathing chamber means to said inflatable gas receptacle so as to allow flow only toward said inflatable gas receptacle;

active gas input means, also coupled to said breathing chamber means;

first and second auxiliary tubes;

a gas filter;

first means for coupling said first auxiliary tube from said inflatable receptacle through said gas filter to an ambient air environment;

second means for coupling said second auxiliary tube from said inflatable receptacle to an ambient air environment; and

gas pump means switchably coupled in conjunction with said first and second coupling means between said first and second auxiliary tubes and operative to selectively cause gas flow from said inflatable receptacle through said first coupling means and said first auxiliary tube toward said ambient environment and from said ambient environment through said second coupling means and said second auxiliary tube toward said inflatable receptacle.

4,202,346

CATHETER FOR THE EXAMINATION OR TREATMENT OF A BLOOD VESSEL AND APPARATUS FOR THE UTILIZATION OF THIS CATHETER

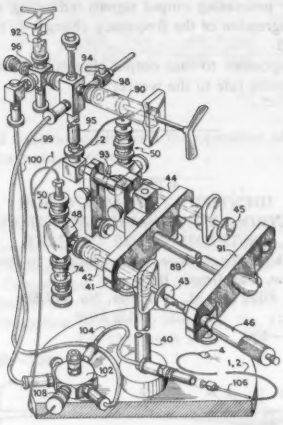
Pierre M. Granier, Nogent-sur-Marne, France, assignor to Societe d'Etudes et d'Applications Technologiques-Serat, Geneve, France

Filed Aug. 8, 1977, Ser. No. 822,942

Claims priority, application France, Aug. 10, 1976, 76 24403

Int. Cl.[2] A61B 6/00

U.S. Cl. 128—658 **20 Claims**



14. An apparatus for obturating a blood vessel comprising in combination:

a catheter comprising an inflatable balloon of expansible material, at least one flexible capillary tube having a uniform diameter which opens at one end thereof into the inflatable balloon, an end member mounted on the tube, an outer connecting socket, and means for clamping an end of the tube opposed to said one end in a sealed manner between the end member and the outer connecting socket, a hypodermic needle for the insertion of the catheter in the blood vessel,

a head receiving said connecting socket which socket is removable from the head,

at least two syringes disposed in parallel relation, one syringe for supplying a fluid product and the other for supplying a rapidly solidifiable viscous product, each of the syringes communicating with the head,

means for clamping the socket in the head in a sealed manner and for evacuating the space therebetween.

4,202,347

METHOD AND APPARATUS FOR DETERMINING BLOOD PRESSURE

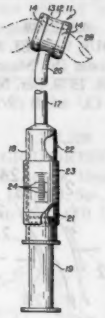
Alvin H. Sacks, 12682 Roble Veneno, Los Altos Hills, Calif. 94022

Continuation-in-part of Ser. No. 750,077, Dec. 13, 1976, abandoned, which is a continuation-in-part of Ser. No. 584,102, Jun. 5, 1975, abandoned. This application Oct. 11, 1977, Ser. No. 841,241

Int. Cl.[2] A61B 5/02

U.S. Cl. 128—677 **25 Claims**

1. A device for determining systolic and diastolic blood pressures without the use of a manometer comprising an inelastic cuff to encircle a portion of the subject's body, a inflatable diaphragm on the inside of said cuff inflatable by fluid which is gaseous to affect blood flow through said portion, a tubular member having a first and a second end, duct means communicating from said first end of said tubular member to the interior of said diaphragm, a plunger, the inner end of said plunger fitting through said second end of said tubular member and engaging the internal wall of said member in a fluid-tight manner, whereby depressing said plunger pressurizes said diaphragm to cut off blood flow through said portion of the subject's body, pressure responsive zero-indicating means indicating when said diaphragm firmly engages said portion of the subject's body without affecting blood flow through said portion, and indicia means cooperable with said inner end of



said plunger to indicate on said indicia means a zero position in response to said zero-indicating means, said indicia means providing a reading of volume change of fluid caused by said plunger at different positions of said plunger within said tubular member, the position of said plunger in said tubular member determining the pressure in said device in accordance with the Perfect Gas Law and thus usable for determining said pressure at the onset and cessation of Korotkoff phenomena.

4,202,348

KOROTKOV SOUND SENSOR

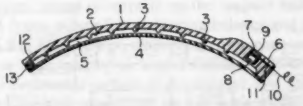
Akira Abe, Takatsuki; Shoji Kimura, Kameoka, and Yuzo Kuwabara, Kyoto, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Aug. 19, 1977, Ser. No. 826,245

Claims priority, application Japan, Sep. 10, 1976, 51/122034[U]

Int. Cl.[2] A61B 5/02

U.S. Cl. 128—680 **4 Claims**



1. A Korotkov sound sensor for an electronic syphgmomanometer comprising:

a curved housing body of elastic material having a hollow therein, said housing body having a length and a width forming a substantially rectangular shape, said hollow having a length and width, said housing body including a top portion, and lengthwise and widthwise sidewalls depending from said top portion, said body including an external microphone support portion which is thicker than the remainder of said body and which has a through hole therein, said lengthwise sidewalls flaring outwardly of said body and causing widthwise expansion of said hollow when external pressure is applied to said top portion;

an expansible thin film, adapted to be placed adjacent an artery of an individual, attached to the depending sidewalls of the curved housing body and forming a curved air chamber in the hollow between the thin film and the body;

a plurality of spaced projections formed on said housing body in said hollow along the lengthwise direction of said body for preventing said thin film from contacting the bottom of said hollow, each said projection having a length which is less than the width of said hollow; and,

a microphone mounted in said through hole in direct communication with said air chamber for detecting Korotkov sounds transmitted through the thin film and the air chamber.

4,202,349

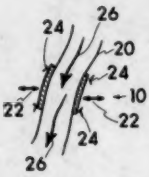
RADIOPAQUE VESSEL MARKERS

James W. Jones, 4108 James Dr., Metairie, La. 70003

Filed Apr. 24, 1978, Ser. No. 899,292

Int. Cl.[2] A61B *19/00*

U.S. Cl. 128—689 **25 Claims**



1. A radiopaque vessel marker comprising:

a. radiopaque marker means adapted for surgical attachment to a portion of an interior blood vessel for indicating the pulsatile flow of blood through the vessel said means providing spaced portions for indicating relative movement with respect to one another during such pulsitile blood flow, said marker means being of a substantially radiopaque material; and

b. means associated with said marker means for attaching said marker means to the interior blood vessel.

4,202,350

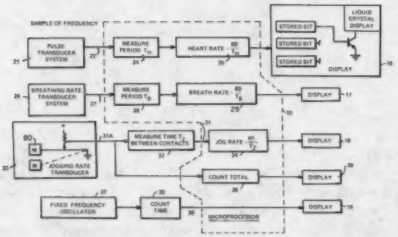
DEVICE FOR MEASURING PULSE, BREATHING AND RUNNING RATE FOR JOGGERS

Charles A. Walton, 20 E. Main St. #33, Los Gatos, Calif. 95030

Filed May 15, 1978, Ser. No. 905,774

Int. Cl.[2] A61B *5/02*

U.S. Cl. 128—690 **3 Claims**



2. A device for measuring body conditions of the wearer, comprising in combination:

means for sensing movement of the skin due to pulse cycles in a wrist, comprising a capacitor having two plates, with one plate adapted to be mounted stationarily on the wrist and the other plate adapted to be mounted adjacent the wrist for movement with the skin as the pulse cycles vary the contour of the wrist;

means for attaching said skin movement sensing means on the wrist;

means for generating a first signal responsive to a change in capacitance of said capacitor, comprising a variable frequency oscillator having a tank circuit, said capacitor being connected in said tank circuit whereby the change in capacitance changes the oscillator output frequency to produce said first signal as an indication of pulse cycling;

means for determining the pulse cyclic rate from said first signal comprising means for sampling said first signal periodically within a pulse cycle, and means for comparing each sample of said first signal with the next sampled first signal to thereby detect cyclic changes in the frequency of said first signal representative of pulse cycling, and for generating output signals indicating a change in the progression of the frequency changes in the first signal; and

means responsive to said output signals for indicating the pulse cyclic rate to the wearer.

4,202,351

IDENTIFICATION MEANS FOR ELECTROCARDIOGRAPHIC MONITORING INSTRUMENTS OR THE LIKE

Barton A. Biche, Binghamton, N.Y., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Jul. 31, 1978, Ser. No. 929,586

Int. Cl.[2] A61B *5/04*

U.S. Cl. 128—696 **26 Claims**

1. Identification means for application to or in combination with the ends of lead wires for electrocardiographic monitoring instruments or the like, comprising:

a terminal body member secured at one end of a lead wire and having a peripheral recess extending substantially thereabout; and

an identification member having identifying means corresponding to one of a plurality of commonly recorded anatomical positions, said identification member being sized to be positionable over at least a portion of said terminal body member including said peripheral recess and having an interior lip snap fit within said recess to retain the identification member onto the terminal body member and prevent unintentional removal therefrom.

4,202,352

APPARATUS FOR MEASUREMENT OF EXPIRED GAS CONCENTRATION IN INFANTS

John J. Osborn, Tiburon, Calif., assignor to Research Development Corporation, San Francisco, Calif.

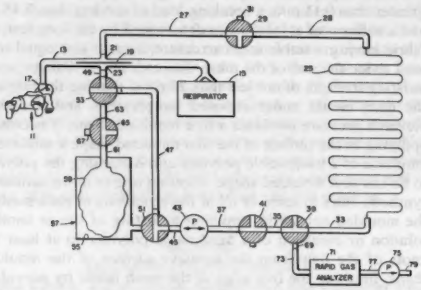
Filed Apr. 6, 1978, Ser. No. 894,170

Int. Cl.[2] A61B *5/08*

U.S. Cl. 128—719 **10 Claims**

1. In an apparatus for measuring expired gas concentrations of a patient, an airway adapted to be placed in communication with the patient's respiratory system, pump means having its intake connected to said airway for drawing a predetermined volume of gas therefrom to be sampled, a captive bag assembly having an outer chamber and a captive bag within said outer chamber, the interior of said captive bag defining an inner chamber, the exhause of said pump means being connected to one of said chambers and the other of said chambers being

connected to said airway whereby the captive bag assembly replenishes the gas to the airway in the same predetermined



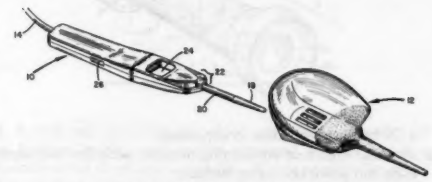
volume and simultaneously with the operation of said pump means to draw gas therefrom.

4,202,353

TEMPERATURE AND RESPIRATION SENSING PROBE

Leon C. Hirsch, Westport; Paul O. Rawson, Easton, and Louis E. Nagy, Killingworth, all of Conn., assignors to United States Surgical Corporation, Stamford, Conn.

Continuation of Ser. No. 771,012, Feb. 22, 1977, abandoned.
This application Mar. 5, 1979, Ser. No. 17,098
Int. Cl.[2] A61B *5/00*
U.S. Cl. 128—724 **8 Claims**



1. A probe for use in sensing temperature and respiration comprising, an elongate housing portion having a rectangular cross-section, said housing having located therein a channel having first and second inlet apertures located in top and bottom surfaces, respectively, of said rectangular cross-section housing, said top and bottom surfaces being on the longer sides of said rectangular cross-section, said channel extending transversely through the entire housing from top to bottom, a tubular rod portion mounted on one end of said elongate housing, said housing and said tubular rod portion being constructed and arranged so as to be symmetrical about their longitudinal axis, temperature sensing means mounted on the end of said tubular rod distal to said housing for insertion into the mouth, respiration sensing means mounted inside said housing and in communication with said channel, wherein one of said first and second inlet apertures is positioned on said housing to be in the path of nasal airflow when said probe is inserted in the mouth.

4,202,354

ELECTROENCEPHALOGRAPH

Leland B. Smith, Englewood, Colo.; Robert A. McIntyre, Skokie, and Raymond M. Pawlak, Addison, both of Ill., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Jun. 9, 1978, Ser. No. 914,062
Int. Cl.[2] A61B *5/04*
U.S. Cl. 128—731 **4 Claims**

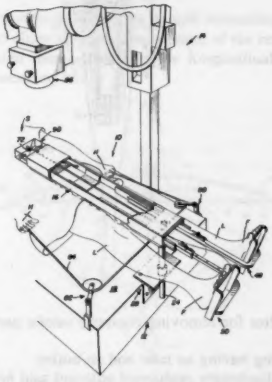
1. In an EEG system, a plurality of patient electrodes, a differential amplifier having first and second inputs, means for selectively connecting a selected one of said electrodes to said first input and simultaneously connecting a selected one of said electrodes to said second input during each of successive time periods which recur in repetitive time position frames, means for reversing the polarity of the output of said differential amplifier during successive ones of said time periods in a time position frame, recording means having a plurality of input channels corresponding to said successive time periods, successive ones of said input channels being arranged to respond to oppositely polarized input signals by producing traces in the same direction, and demultiplexing means for sequentially connecting said reversed polarity amplifier output to said plurality of recording input channels.

4,202,355

X-RAY GRID ORTHOMETER

Cecil W. Loeffler, 912 E. Acacia, Hemet, Calif. 92343

Filed Aug. 14, 1978, Ser. No. 933,785
Int. Cl.[2] A61B *5/10*
U.S. Cl. 128—774 **14 Claims**



1. An X-ray grid orthometer, comprising, in combination:
(a) frame means mountable on a support for adjusting to the length of the legs of a subject being measured for leg imbalance;
(b) indicator means mountable on the support and mounted on the frame means for registering balance and imbalance of the legs of a subject, wherein the frame means includes a linear slide bearing arranged substantially horizontally over a horizontal surface of the support, the slide bearing being pivotally mountable on the support for swinging movement about a substantially vertical axis to enable centering of said frame with respect to said support.

4,202,356

TOBACCO SMOKE FILTER MATERIAL

George A. Digenis, and Manvendra B. Shambhu, both of Lexington, Ky., assignors to University of Kentucky Research Foundation, Lexington, Ky.

Filed Jul. 8, 1976, Ser. No. 703,319
Int. Cl.[2] A24B *15/02*; A24D *1/06*; C08F *8/00, 8/18*
U.S. Cl. 131—10.9 **9 Claims**

1. A tobacco smoke filter comprising an imidazole-containing polymer wherein the imidazole has an acyl functional group, said imidazole being chemically bound to said polymer.

4,202,357

REORDERING EXPANDED TOBACCO BY WATER MIST

Roger Z. de la Burde, Powhatan; Patrick E. Aument, Hopewell, and Francis V. Utsch, Chester, all of Va., assignors to Philip Morris Incorporated, New York, N.Y.

Filed Oct. 27, 1978, Ser. No. 955,359
Int. Cl.[2] A24B *3/04, 3/12, 3/18*
U.S. Cl. 131—140 R 7 Claims

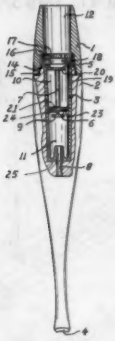
1. A process for reordering expanded tobacco comprising spraying the expanded tobacco with a fine water mist characterized by an average droplet size of less than about 120 microns diameter.

4,202,358

FILTER FOR CIGARETTES WITH TWO CHAMBERS

Dimitrios Drapaniotis, Menelaou 15-17, Ilioupolis, Athens, Greece

Filed Jul. 27, 1978, Ser. No. 928,378
Claims priority, application Greece, Apr. 4, 1978, 60479
Int. Cl.[2] A24F *13/04*
U.S. Cl. 131—187 2 Claims



1. A filter for removing cigarette smoke particles comprising:
- a housing having an inlet and an outlet;
- a first diaphragm positioned adjacent said housing inlet;
- a second diaphragm positioned midway along the length of said housing and dividing said filter into first and second chambers;
- at least one smoke particle condensing surface means being positioned within each of said first and second chambers;
- a longitudinal extending rod-like member, said rod-like member being connected at one end to said at least one smoke particle condensing surface means in said first chamber, and wherein a distal end portion of said rod like member supports said second diaphragm;
- wherein said smoke particles condensing surface means provide additional surfaces upon which said particles condense after passing through at least said first diaphragm.

4,202,359

NOVEL MESH FABRIC AND WIG AND HAIR-PIECE MADE THEREFROM

John D. Clifton, 50 Elgin Crescent, London W 11, England, and Victor W. Titow, Soke Poges, England, assignors to John David Clifton, London, England

Division of Ser. No. 842,328, Oct. 14, 1977. This application Jan. 22, 1979, Ser. No. 5,575
Claims priority, application United Kingdom, 43129/76, 14987/77
Int. Cl.[2] A41G *3/00*
U.S. Cl. 132—5 10 Claims

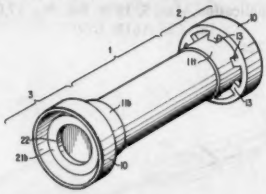
1. A process for the production or a wig or hair-piece which comprises taking an impression of the area of the scalp to be covered, forming a male mould from the impression, applying to the male mould a mesh fabric formed from filaments or yarns of a synthetic material having a mean diameter of not greater than 0.11 mm, a breaking load of not less than 0.45 lbs, and a stiffness of at least 3:1 as determined by the loop test, the fabric having a stable mesh structure, a mesh size equal to at least twice the size of the mean diameter of the filament and a bursting strength of not less than 20 p.s.i., shaping the fabric to the male mould under elevated temperature, and if desired elevated pressure to obtain a first moulded shape, if necessary applying to the surface of the first moulded shape a solution or emulsion of a hardenable polymer and hardening the polymer to fix the first moulded shape, knotting one or more natural or synthetic hairs to some or all of the cross-bars of each mesh of the moulded net fabric, applying a coating of the or another solution or emulsion of a hardenable polymer to at least the knots of the hair from the concave surface of the moulded shape, finishing the free edge of the mesh fabric by providing thereon a band of a non-mesh material, and if desired trimming the margin to the line of knotted hair.

4,202,360

HAIR CURLING ROLLER

Walter Henry J., Wilton, Conn., assignor to Clairol Incorporated, New York, N.Y.

Filed Apr. 19, 1978, Ser. No. 897,809
Int. Cl.[2] A45D *2/00*
U.S. Cl. 132—40 15 Claims



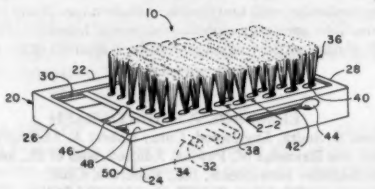
1. A hair curling roller comprising:
- a. a tubular high heat conducting member with first and second ends and a flocked outer surface;
- b. a top radial flanged end having a top base means engaging the flocked outer surface of the first end of said tubular member; and
- c. a bottom radial flanged end having a bottom base means engaging the flocked outer surface of the second end of said tubular member.

4,202,361

POCKET BRUSH

John E. Bills, 667 Osceola Ave., Apt. C, Winter Park, Fla. 32789

Filed Apr. 26, 1978, Ser. No. 900,165
Int. Cl.[2] A45D *24/10*
U.S. Cl. 132—123 3 Claims



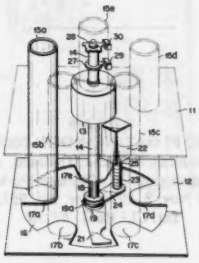
1. In a brush employing parallelogramming action for folding a plurality of free-end tufts having connection to a casing permitting at least a portion of each tuft to pivot at the base of the tuft relative to the casing, and means for pivoting at least a

portion of each tuft, the improvement comprising: the means for pivoting including a plate having a plurality of perforations with respective upper and lower edges, each perforation directly receiving therein a respective tuft intermediate said connection to the casing and free-end of the tuft, means slidably connecting the plate and casing in location operatively extending the free ends of the tufts from the plate at a first slidable position and retracting the free ends of the tufts at a second slidable position, and means affording selection of tuft stiffness for brushing including said perforations being inclined outwardly in the plate in the direction of the second slidable position, the plate having proportion causing catercornered clamping of each of the tufts between a said upper edge and a lower edge of a perforation at the first slidable position.

4,202,362
COIN-DELIVERING DEVICE

Toshio Kashio, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Aug. 23, 1978, Ser. No. 936,028
Claims priority, application Japan, Aug. 26, 1977, 52-102396
Int. Cl.[2] G07D 1/00
U.S. Cl. 133—4 A **9 Claims**



1. A coin-delivering device which comprises a plurality of coin holders having coin outlets arranged at intervals in a circumferential direction; a plurality of coin receptacles set at substantially corresponding intervals in a circumferential direction below the coin outlets of the coin holders at a prescribed spacing from the coin holders to receive individual coins from the holders; a coin-flipping arm fitted to a rotary shaft, said coin flipping arm being vertically movable relative to said rotary shaft and rotatable therewith to deliver a said individual coin placed on any of the coin receptacles by the rotation of said rotary shaft; and control means for controlling the vertical movement of the coin-flipping arm along the rotary shaft, said control means being selectively operated in accordance with the rotational angle of the coin-flipping arm relative to the coin outlets of the respective coin holders in order to selectively deliver one or more coins in a predetermined manner.

4,202,363
UMBRELLA TYPE COLLAPSIBLE SHELTER

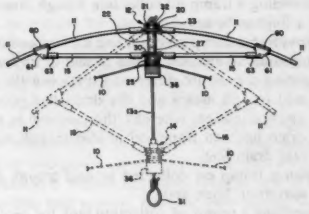
Paul J. Watts, Sandy; Lynn D. Crawford, and Philip T. Nichols, both of Salt Lake City, all of Utah, assignors to American Ecosystems, Inc., Salt Lake City, Utah

Filed Oct. 10, 1978, Ser. No. 950,028
Int. Cl.[2] A45F 1/04
U.S. Cl. 135—2 **9 Claims**

1. In a collapsible shelter of the umbrella-tent type wherein the shelter includes a foldable frame and a cover of sheet material affixed to the frame, with said frame comprising an elongate erecting guide; a plurality of support members for supporting said cover when said frame is erected; a first hub mounted on said erecting guide; first pivotal connecting means for pivotally connecting mutually respective ends of said support members to said first hub, so that when the shelter is erected, the support members extend outwardly and downwardly from said first hub, and when the shelter is collapsed, the support members extend downardly as a bundle, with the support members being in proximate side-by-side relationship; a second hub mounted on said erecting guide below said first hub, said first and second hubs being adjustable between a collapsed position in which said first and second hubs are located remote from each other, and an erected position, in which the first and second hubs are proximate each other; a plurality of rib members, equal in number to the number of support members; second pivotal connecting means for pivotally connecting mutually respective ends of said rib members to the second hub; means for pivotally connecting the other mutually respective ends of said rib members to corresponding support members, such that when the shelter is erected, said rib members extend substantially radially outwardly from said erecting guide and when the shelter is collapsed, said rib members extend downwardly, substantially within said bundle of collapsed, support members, the improvement comprising:

providing a cylindrical bore through said first hub from the upper end to the lower end thereof, with said erecting guide passing longitudinally through said bore in said first hub;

at least one of said first and second pivotal connecting means is adapted to allow rotational movement of the respective hub associated therewith about the longitudinal axis of said guide member; and



means are provided for releasably connecting and holding said first and second hubs together as a rigid unit when said first and second hubs are located proximate each other in the erected position, thereby avoiding untimely collapse of said shelter by inadvertent, undesired movement of said first and second hubs to a position separate and apart from each other, said means for releasably connecting said first and second hubs together as a rigid unit comprising:

one of said first and second hubs having a counterbore in the end thereof facing the other hub, said counterbore being eccentric with the bore which extends through said first hub, and, therefore, eccentric with respect to the erecting member positioned within said bore; and

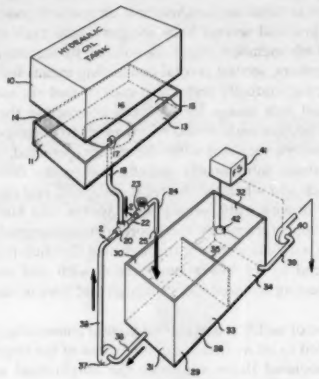
the other hub having an upstanding cylindrical portion forming its end which faces the hub having the counterbore, said upstanding cylindrical portion being adapted for sliding engagement within said counterbore, said upstanding-cylindrical portion also being eccentric with respect to the erecting guide which, in turn, extends from the free end of said upstanding cylindrical portion and through the bore in the mutually opposite hub,

whereby, when said upstanding cylindrical portion is engaged in said counterbore and one of the hubs is rotated by about one-quarter to three eighths of a turn about the longitudinal axis of said erecting guide, said first and second hubs are bound together with said erecting guide as a rigid unit.

4,202,364
METHOD FOR SEPARATING FLUIDS BY MEANS OF PRESSURE DIFFERENTIAL

Graydon L. Karr, 2237 Swainwood Dr., Glenview, Ill. 60025

Filed Nov. 29, 1978, Ser. No. 964,740
Int. Cl.[2] H01M *4/20, 4/70*
U.S. Cl. 137—13 1 Claim



1. The method of removing tramp oil from a tramp oil collecting station in a system according to the steps of:

providing a tramp oil collection trough means for receiving a fluid to be removed;

providing a tramp oil drain line means in said trough means;

providing an ejection means in said drain line means;

creating a pressure differential between the air pressure in said trough means and the drain line pressure with said ejection means, whereby the pressure is reduced in said drain line and tramp oil in said trough means will enter said drain line;

passing tramp oil collected in said trough means through said drain lines; and,

providing a tramp oil collection tank for receiving tramp oil which passes through said drain line;

whereby tramp oil collected in said trough will be pulled through said drain line into said collection tank by a higher pressure stream from said collection tank which is passed through said ejection means.

4,202,365
FIRE TESTED BUTTERFLY VALVE

Tadashi Aoki, Ohmiya, Japan; Jerry D. MacAfee, Northborough, and James F. Donnelly, Leicester, both of Mass., assignors to Jamesbury Corporation, Worcester, Mass.

Filed Jan. 4, 1978, Ser. No. 866,814
Int. Cl.[2] F16K *5/06*
U.S. Cl. 137—72 5 Claims

1. A butterfly valve comprising:

a housing defining a fluid flow channel;

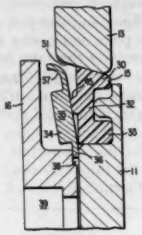
a shaft;

a butterfly valve disc mounted on said shaft for rotation within said channel to control fluid flow therethrough;

an annular resilient seat member circumscribing said channel to sealingly cooperate with the edge of said disc when said disc is perpendicular to said channel;

an annular, flexible metal seat member adjacent said resilient seat member;

means positioned between said resilient seat and said metal seat resisting biasing of said metal seat into contact with said disc and to hold said metal seat in a flexed position normally out of contact with said edge of said disc but which will melt upon exposure to fire thereby permitting said metal seat to flex and contact said disc edge and establish a secondary, metal-to-metal, fire resistant seal; and

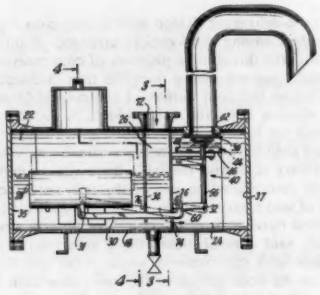


an insert ring wherein said housing and said insert ring form a groove positioned along an outer portion of said metal seat, within which said outer portion of said metal seat is fixed.

4,202,366
AUTOMATIC FLOATING ROOF DRAIN VALVE

Bhinyo Kamvachirapitag, Sriracha, Thailand, assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Nov. 3, 1978, Ser. No. 957,542
Int. Cl.[2] B65D *87/18*
U.S. Cl. 137—172 10 Claims

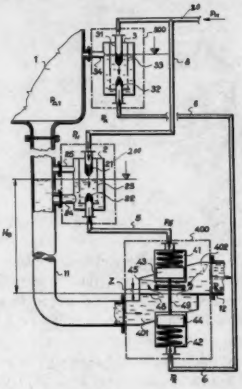


1. A valve system for use with a floating roof of a storage tank having a roof drain outlet, comprising, in combination: a valve body operably connected with the floating roof for automatically closing the roof drain outlet; said body having an inlet passage means and outlet means and including first and second compartments, wherein said inlet passage means is for receiving fluid flow from said roof drain outlet; valve means in said first compartment for opening and closing said outlet means; float means having predetermined buoyancy disposed in said second compartment, for controlling the opening and closing of said valve means, said float means being constructed and arranged to be buoyant in water and sink in oil; partition means separating said inlet passage means from said first and second compartments for preventing premature closing of said valve means; and linkage means connecting said valve means with said float means for controlling the opening and closing of said valve body outlet.

4,202,367
CIRCUIT ARRANGEMENT FOR REGULATING THE LEVEL OF LIQUID IN VESSELS

Zdenek Roth, Pilsen, and Josef Altmann, Domazlice, both of Czechoslovakia, assignors to Skoda, oborovy podnik, Pilsen, Czechoslovakia

Filed Nov. 13, 1978, Ser. No. 960,020
Claims priority, application Czechoslovakia, Nov. 24, 1977, 7773/77
Int. Cl.[2] G05D 9/04
U.S. Cl. 137—187 4 Claims

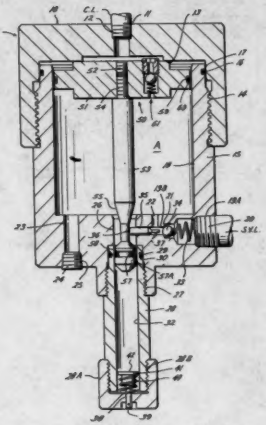


1. A circuit arrangement for the regulation of the liquid level in vessels, comprising in combination a draining vessel with a draining conduit connected thereto, a fluid level pick-up device, a compensating pick-up device, a working element, a feeding conduit from a source of a pressure liquid, a signal conduit and a compensation conduit, each of the fluid level pick-up device and the compensation pick-up device comprising a chamber with an upper part and a lower part, an upper transmission nozzle with its mouth directed downwards fixed in the upper part of said chamber, and a lower receiving nozzle with its mouth directed upwards fixed in the lower part of said chamber, the mouths of the upper and lower nozzles being spaced vertically from each other, the working element comprising an upper space and a lower space, a passage for liquid between said upper and lower space, valve means for the adjustment of the resistance against the passage of liquid through the working element in dependence upon the respective pressures acting on the upper space and the lower space thereof, means connecting the upper space of the fluid level pick-up device to the draining conduit above the regulated liquid level therein, means connecting the lower space of the fluid level pick-up to the draining conduit below the regulated liquid level therein, means connecting the upper space of the compensation pick-up device to the draining vessel above the level of the regulated liquid in the draining vessel, conduit means connecting the transmission nozzles of both the fluid level pick-up device and of the fluid compensation pick-up device to a source of pressure liquid, the compensation conduit connecting the receiving nozzle of the compensation pick-up device to the lower space of the working element, and the signal conduit connecting the receiving nozzle of the fluid level pick-up device to the upper space of the working element.

4,202,368
SAFETY VALVE OR BLOWOUT PREVENTER FOR USE IN A FLUID TRANSMISSION CONDUIT

Neil H. Akkerman, and Kip B. Goans, both of New Orleans, La., assignors to Baker CAC, Inc., Belle Chasse, La.

Filed Mar. 13, 1978, Ser. No. 886,204
Int. Cl.[2] F16K 17/20
U.S. Cl. 137—498 6 Claims



1. A blowout preventer for use in a control conduit for a safety valve, said safety valve being manipulatable between opened and closed position upon variation of pressure within said control conduit, said blowout preventer comprising: a housing; piston means carried within said housing; first valve means for metering flow of fluid in first direction within said control conduit; and second valve means being maintained in opened position by said piston means when fluid flow through said first valve means is within a predeterminable rate in said first direction within said control conduit, said second valve means being manipulatable to closed position by said piston means when an excess of said predeterminable rate of fluid flow in said first direction within said control conduit is metered through said first valve means.

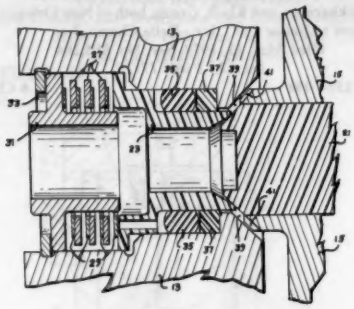
4,202,369
GAS RELIEF VALVE DESIGN FOR LOW TEMPERATURE

Joseph T. Viravec, Renton, and Maurice A. Hoyt, Redmond, both of Wash., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 15, 1978, Ser. No. 916,024
Int. Cl.[2] F16K 31/12
U.S. Cl. 137—508 1 Claim

1. In a gas relief valve for use in passing pressurized gas at low temperatures and high rates into a container, said gas relief valve having a spring biased valve stem with a soft seal portion on the top thereof and a slidable seal for engagement with said soft seal, said gas passing between said seat and said seal and through an annular region when the pressure is above a predetermined valve, said valve contacting said container and sealing the annular region when the pressure falls below the predetermined level, the improvement comprising a series of slots across the end of said valve stem where it makes contact with the container, said slots allowing trapped gas in the annular region to escape into said container and thereby prevent pres-

sure from increasing in the annular region and adversely affecting the operation of the relief valve by changing the seat/seal



contact force and causing the valve to operate at less than its proper design cracking pressure.

4,202,370

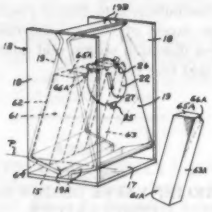
APPARATUS FOR USE IN GENERATING LIQUID CONCENTRATION GRADIENTS HYDROSTATICALLY

John E. Joyce, 22 Nelson Rd., South Weymouth, Mass. 02190

Division of Ser. No. 701,173, Jun. 30, 1976, Pat. No. 4,074,687. This application Jan. 12, 1978, Ser. No. 868,853

Int. Cl.[2] G05D *11/03*

U.S. Cl. 137—585 **4 Claims**



1. An insert for a chamber for a liquid concentration gradient, said chamber having a bottom, end walls and side walls which are inclined inwardly and upwardly towards each other to provide a narrow entrance and which include downwardly and inwardly inclined lower portions joining said bottom, one side wall having a porthole and a removable plug sealing said porthole, said insert including a series of sections, each section including first and second parallel walls, the first wall for engagement with the other side wall, a lower end to seat against the downwardly inclined lower portion of said other side wall and an upper end to engage with the side wall having the porthole a selected distance above a plane inclusive of the junctions of the side walls with their lower portions, each section dimensioned for entry through the porthole and to be placed in position in the chamber, the entrance sections when thus installed extending from one end wall of the chamber to the other.

4,202,371

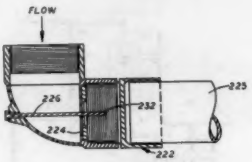
SYSTEM FOR POLLUTION SUPPRESSION

Edward T. Armstrong, Butler, N.J., assignor to TII Corporation (Telecommunications Industries, Inc.), Lindenhurst, N.Y.

Division of Ser. No. 531,095, Dec. 9, 1974, Pat. No. 3,998,714, which is a continuation-in-part of Ser. No. 355,738, Apr. 30, 1973, Pat. No. 3,853,764, which is a continuation-in-part of Ser. No. 100,333, Dec. 21, 1970, Pat. No. 3,730,881, which is a continuation-in-part of Ser. No. 813,382, Feb. 28, 1969, Pat. No. 3,549,528, which is a continuation-in-part of Ser. No. 362,118, Apr. 23, 1964, abandoned. This application Sep. 24, 1975, Ser. No. 616,487

Int. Cl.[2] F16K *19/00*

U.S. Cl. 137—604 **12 Claims**



1. An apparatus for the treatment of a fluid by a treating fluid, comprising;

a flow pipe for a fluid having a Reynolds number of at least 3,000, said flow pipe having a flat plate orifice located therein, a vena contracta portion located in said fluid in said flow pipe at a distance of from 0.25 to 0.5 pipe diameters downstream from said flat plate orifice, the internal diameter of said flat plate orifice ranging from about 0.7 to about 0.9 of the internal diameter of said pipe,

a thin injection nozzle means for introducing a treating fluid into said flow pipe, said injection nozzle extending through said flat plate orifice and coaxially located in said pipe, said thin nozzle having a thin tip, said treating fluid flowing through said nozzle tip, said nozzle tip located in said vena contracta portion so that said treating fluid is dispersed into said fluid, said nozzle tip being located at about 0.25 to about 0.5 pipe diameters downstream from said flat plate orifice so that said fluid is thoroughly treated with said treating fluid.

4,202,372

ARTICULATED FLUID CONDUIT WITH AUXILIARY SUPPORT

Harold M. Gibbons, Long Beach, Calif., assignor to FMC Corporation, San Jose, Calif.

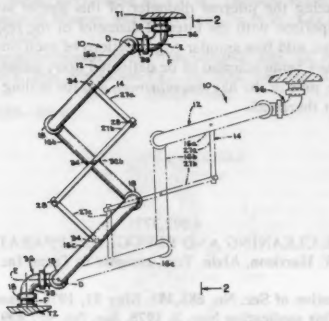
Filed Dec. 1, 1976, Ser. No. 746,454

Int. Cl.[2] B67D *5/04*; F16L *27/02*

U.S. Cl. 137—615 **8 Claims**

1. An expandable and contractable fluid conduit assembly for extension between relatively movable terminals comprising in combination: a first branch of a lazy tong including a plurality of fluid-conducting rigid pipe sections arrayed in end-to-end relation, a plurality of annular fluid-conducting swivel joints having rigid relatively rotatable portions respectively connected between said pipe sections to define an articulated pipe operable to convey fluid from one end to the other, a second branch of a lazy tong including a plurality of rigid elongated support sections, means pivotally connecting said support sections in end-to-end relation to define an articulated support member, said two branches criss-crossing at intersections of each pipe section and support section of the branches, means pivotally connecting said respective branch sections at said intersections, and a three-axis swivel connected to each end of the fluid-conducting pipe for respective connection to

the flow terminals, whereby said assembly may partake of universal movement about the three axes of each swivel, and



expansion and contraction, upon occurrence of relative movement between said terminals.

4,202,373

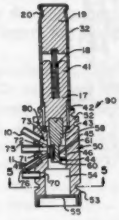
FOUR WAY VALVE

David P. Hargraves, Webster Groves; Jude A. Pauli, Florissant, and Steven E. Williams, St. Louis, all of Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Oct. 7, 1977, Ser. No. 840,299

Int. Cl.[2] F16K *11/06, 31/06*

U.S. Cl. 137—625.29 **10 Claims**



1. A four way valve assembly, comprising:

a valve housing having a cavity in it, said housing having an inlet, an outlet and a pair of working lines connected to it and communicating with said cavity;

a main valve member movably mounted in said cavity and adapted to connect the outlet and inlet of said valve selectively to said working lines, said valve member having ends which cooperate with said housing to define a pair of opposed chambers in said housing;

a pilot body mounted to said valve housing, said pilot body having an axial opening in it, and at least four radial openings extending through it, said radial openings communicating with said axial opening;

a plurality of fluid connectors connected between the radial openings in said pilot body and said valve housing, one of said connectors extending between said inlet and one radial opening, a second of said connectors extending between said outlet and the second of said radial openings, the third and fourth of said connectors extending between respective ones of said opposed chambers in said housing and said third and fourth openings; and

a solenoid actuated mechanism mounted to a first end of said pilot body, said solenoid actuated mechanism including a plunger movably mounted in said body, and a pilot slide mounted to said plunger and movable therewith, said pilot slide having a cavity formed in it for interconnecting one of said third and said fourth connectors with said inlet and said outlet connectors to operatively connect opposed ones of said chambers with high pressure fluid, said plunger having a slot formed in it, said slot being sized to receive a portion of said plunger in a loose fit, said high pressure fluid maintaining said pilot slide in a selected position with respect to said connectors and properly positioned with respect to said plunger.

4,202,374

FLUID SWITCH WITH REFLECTED SHOCK WAVE

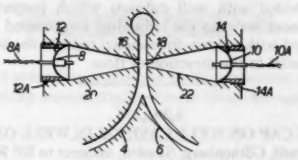
Denis V. Butler, Fareham, England, assignor to Plessey Handel und Investments AG, Zug, Switzerland

Filed Feb. 24, 1978, Ser. No. 880,867

Claims priority, application United Kingdom, Mar. 2, 1977, 8858/77

Int. Cl.[2] F15C *1/04*

U.S. Cl. 137—827 **2 Claims**



1. A fluid switch device in which shockwave energy is utilized to switch the path of a fluid comprising, a fluid input channel means for guiding fluid flow from a fluid source; a first fluid output channel means connected with said fluid input channel means for guiding fluid flow from said fluid input channel means; a second fluid output channel means connected with said fluid input channel means for guiding fluid flow from said fluid input channel means; switching means for selectively directing fluid flow from said fluid input channel means to one of said first and second fluid output channel means, said switching means comprising, a reflector means for reflecting a shockwave, said reflector means comprising a conical surface of revolution having a parabolic base, said surface of revolution defining an opening at its apex, said opening in fluid communication with said fluid input channel means upstream of said first and second fluid output channel means; and means for propagating a shockwave comprising an electrical discharge source, said electrical discharge source positioned in said conical surface of revolution between said parabolic base and said opening, wherein said shockwave is reflectable by said reflector means toward said opening.

4,202,375

PROCESS AND APPARATUS FOR ACHIEVING A UNIFORM FLOW PROFILE

Werner Hoerauf, Ludwigshafen; Hans Pirzer, Frankenthal; Ernst Guenther, Ludwigshafen; Eckart Neumann, Frankenthal, and Ernst Dietrich, Worms, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 667,881, Mar. 18, 1976, abandoned. This application Dec. 12, 1977, Ser. No. 859,459

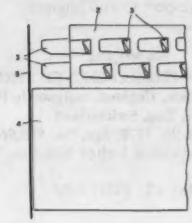
Claims priority, application Fed. Rep. of Germany, Mar. 29, 1975, 2514129

Int. Cl.[2] F15D *1/02*

U.S. Cl. 138—39 **4 Claims**

1. Apparatus for achieving a uniform flow profile of a very viscous fluid when flowing through a tube comprising in combination a flow tube, at least two discs arranged at axial intervals within said flow tube transversely to the direction of flow, each disc consisting of a plurality of ring-shaped bands of increasing diameter, the bands being arranged freely of one another and concentrically at intervals on a grid supporting means of said tube to provide correspondingly concentric open

spaces therebetween over the entire cross-section of the tube, with the walls of the bands running parallel to the direction of flow, and the bands of the separate discs being staggered with respect to each other as viewed in the direction of flow and



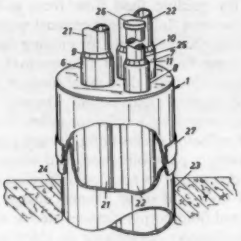
being provided with wall cut-outs which project into the annular spaces between the individual ring-shaped bands and are arranged with a three-dimensional twist to the left or right of and parallel to the direction of flow.

4,202,376

CLOSING CAP ON WELL CASINGS IN WELL OPENINGS

Bror I. Forsell, Göthenburg, Sweden, assignor to RP Rorprodukter AB, Göthenburg, Sweden

Filed Sep. 13, 1978, Ser. No. 942,116
Claims priority, application Sweden, Oct. 26, 1977, 7712037
Int. Cl.[2] F16L *55/00*
U.S. Cl. 138—89 **1 Claim**



1. An improved closing cap of elastic material to be mounted on and seal the upper end of a well casing, arranged in a well opening, said closing cap comprising a number of sleeves projecting vertically from the upper part of said cap to allow tubes, pipes, conduits, and similar means to pass through said sleeves from a pump provided at the lower part of said well opening, said upper end comprising a steel plate with openings molded therein; and a hose clip to tighten a cap wall portion; the improvement comprising

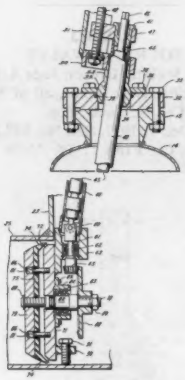
a lower portion of said cap having a first diameter sized to receive a first diameter well casing, the upper portion of said cap being formed with a second diameter smaller than said first diameter and sized to receive a second diameter well casing, an annular shoulder formed on the wall of the cap between said first and second diameters and close to the centre of said cap, said shoulder allowing the lower portion of said cap to be arranged in a sealing position on the first diameter well casing with said first diameter encircling the first diameter well casing and said annular shoulder engaging the upper end of the first diameter well casing in sealing relationship or with said upper portion of said cap arranged in sealing position on the second diameter well casing with said second diameter portion engaging the periphery of the second diameter well casing and a shoulder formed at the upper edge of said upper portion in sealing engagement with the upper edge of the second diameter well casing; said closing cap further comprising a tapering, inwardly bent section on the upper free annular edge portion of each one of said sleeves, said section reducing the internal diameter of this sleeve portion in comparison with the internal diameter of the rest of said sleeve, said free annular edge portions of each one of said sleeves being adapted to be deflected upon passing of the tube, pipe or the like therethrough and for sealing engagement therewith.

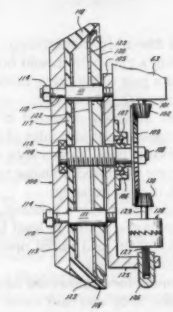
4,202,377

PIPE CLEANING AND PLUGGING APPARATUS

George W. Harrison, Alvin, Tex., assignor to Team, Inc., Alvin, Tex.

Continuation of Ser. No. 685,351, May 11, 1976, abandoned.
This application Nov. 3, 1978, Ser. No. 957,409
Int. Cl.[2] F16L *55/12*
U.S. Cl. 138—94 **4 Claims**





1. An apparatus for plugging a fluid carrying pipeline through a side opening therein, the combination comprising:

a drive shaft assembly adapted for having the lower end thereof inserted into said pipeline through said side opening;

a plug assembly attached to said lower end of said drive shaft assembly,

said plug assembly including an annular seal having a circumferential lip portion arranged for sealing engagement with the inside surface of said pipeline upon radially outward deflection thereof.

4,202,378

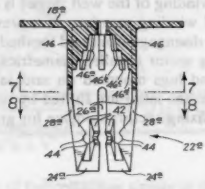
REBAR SAFETY CAP

Lyman F. Bush, 1217-122nd St. Ct. E., Tacoma, Wash. 98445, and Dennis R. Weaver, 4614 Ray Nash Dr. N.W., Gig Harbor, Wash. 98335

Continuation-in-part of Ser. No. 695,001, Jun. 11, 1976, abandoned. This application Feb. 16, 1978, Ser. No. 878,437

Int. Cl.[2] B65D *59/06*

U.S. Cl. 138—96 R **1 Claim**



1. A safety cap for use on the projecting ends of rebar comprising:

(a) an integrated, hollow cylindrical body of resiliently deformable plastic material, closed at one end and open at the other,

(b) the open end of the body being slotted longitudinally at circumferentially spaced intervals to provide a plurality of longitudinally elongated resiliently expandable fingers, and

(c) gripping ribs projecting radially inward from the fingers intermediate the ends of said fingers and defining a rebar entrance opening of reduced diameter with respect to the inwardly adjacent bore of the hollow body, the inner surfaces of the ribs diverging angularly outward to the outer ends of the fingers for guiding rebar into said entrance opening,

(d) a plurality of longitudinally extending, circumferentially spaced, abutment ribs extending radially inwardly within and adjacent the closed end of the hollow body, the ribs being tapered and notched to provide longitudinally spaced rebar abutment shoulders of progressively decreasing diameter toward the closed end of the body, for abutting the rebar both radially and axially and

(e) a flat overhanging impact head of substantial extent and generally circular contour extending radially outward from the closed end of the body.

4,202,379

SEALING ARRANGEMENT

Manfred Vetter, Burg Langendorf, 5352 Zülpich, Fed. Rep. of Germany

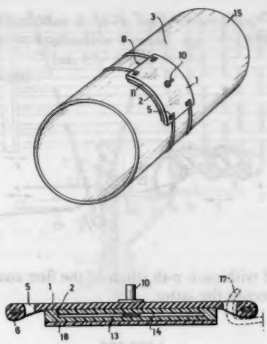
Filed Oct. 2, 1978, Ser. No. 947,748

Claims priority, application Fed. Rep. of Germany, Oct. 10, 1977, 2745506

Int. Cl.[2] F16L *55/16*

U.S. Cl. 138—99 **16 Claims**

1. In a sealing arrangement of the type which is laid against the leaking surface of a pipe, conduit, vessel or the like, in combination, an inflatable pad to be laid against the leaking surface to be sealed; and a flexible counterpressure pad joined to the inflatable pad at the side of the inflatable pad which faces away from the leaking surface to be sealed, the flexible counterpressure pad having edge regions provided with connectors to which can be connected holding belts or cables wrapped around such pipe or the like, whereby when the inflatable pad is laid against a leaking surface both the inflatable pad and also the counterpressure pad can conform to the leaking surface prior to inflation of the inflatable pad, the counterpressure pad having two spaced edge regions provided with reinforcements, the reinforcements extending transverse to the direction in which the counter-pressure pad tends to be stretched when held in place by holding belts or the like wrapped around a pipe or the like, and further including cords of reinforcing material accommodated within the material of the counter-



pressure pad extending transverse to the transverse reinforcements and slung around the transverse reinforcements.

4,202,380

DROP PLATE FOR AN ELECTRICAL STOP MOTION OF A WEAVING MACHINE

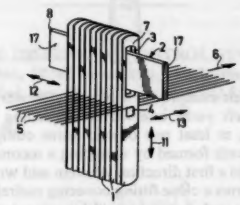
Hartmann Bader, Bad Liebenzell, Fed. Rep. of Germany, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Jun. 12, 1978, Ser. No. 914,769

Claims priority, application Switzerland, Jun. 15, 1977, 7342/77

Int. Cl.[2] D03D *51/32*

U.S. Cl. 139—368 **12 Claims**



1. A drop plate for a stop motion of a weaving machine, said drop plate having an aperture for passage of a search bar therethrough, a metallic zone around said aperture for effecting an electrical contact with the search bar, and a strip of vibration-damping material extending over the entire length of the drop plate.

4,202,381

RIBBON FABRIC, METHOD FOR THE MANUFACTURE THEREOF AND RIBBON LOOM FOR CARRYING OUT THE METHOD

Robert R. Bucher, Frick, Switzerland, assignor to Jakob Muller, Forschungs und Finanz AG, Frick, Switzerland

Filed Jul. 5, 1977, Ser. No. 812,861

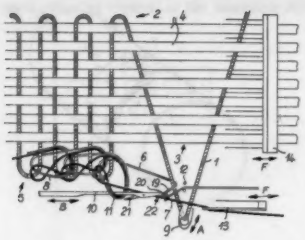
Claims priority, application Switzerland, Jul. 8, 1976, 8795/76

Int. Cl.[2] D03D *5/00*

U.S. Cl. 139—383 R **21 Claims**

1. A ribbon fabric having weft thread loops inserted from one side of a warp thread shed, a first auxiliary thread drawn

through the weft thread loops and forming stitches, and a second auxiliary thread located externally of the weft thread



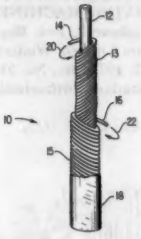
loops knitted with each n-th stitch of the first auxiliary thread in order to secure the latter.

4,202,382

DRYER FELTS

William T. Westhead, Waycross, Ga., assignor to Scapa Dryers, Inc., Waycross, Ga.

Filed Jun. 13, 1978, Ser. No. 915,238
Int. Cl.[2] D03D *23/00*
U.S. Cl. 139—383 A **55 Claims**



1. A dryer felt comprising a plurality of warp yarns and a plurality of weft yarns interwoven according to a selected weave pattern, at least one of said yarns comprising a core fiber, a first sheath formed by wrapping a second fiber around said core fiber in a first direction wherein said wrapping of said second fiber forms a close fitting covering entirely around said core fiber, a second sheath formed by wrapping a third fiber around said first sheath in a direction different from said first direction wherein said wrapping of said third fiber forms a close fitting covering entirely around said first sheath, and a covering formed by coating said second sheath with a resin.

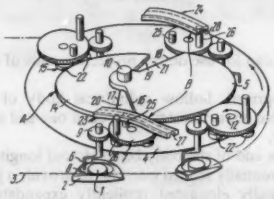
4,202,383

APPARATUS FOR WINDING A WEFT THREAD ONTO SPOOLS OF CARRIERS IN TRAVELLING-WAVE LOOMS

Alexandr L. Galperin, ulitsa Moldagulovoi, 10, korpus 3, kv. 166; Albert S. Serebryannikov, ulitsa Krasikova, 11, kv. 63; Eduard A. Onikov, ulitsa Panferova, 5, korpus 2, kv. 106; Alexandr A. Zabotin, Belyaevo-Bogorodskoe, kvartal 45, korpus 26, kv. 87, all of Moscow; Evgeny D. Loschilin, Kashirskoe shosse, 36, kv. 87, Domodedovo Moskovskoi oblasti, all of U.S.S.R., and Nicola Santucci, Viale del Industria 32, Schio (Vicenza), Italy

Filed Sep. 11, 1978, Ser. No. 941,237
Int. Cl.[2] D03D *47/26*
U.S. Cl. 139—436 **6 Claims**

1. An apparatus for winding a weft thread onto spools of carriers in travelling-wave looms, comprising: a disk rotatable in a horizontal plane; a means for rotating said disk; winding members rotating around their axles, intended for winding of the weft thread onto spools of carriers and mounted on said disk; satellite gears constantly meshed with said winding members and mounted so as to be rotatable around their axles on said disk; a stationarytoothed sector arranged coaxially with said disk; said satellite gears engaging said toothed sector for rotating together with said winding members, when displaced by said disk, around this toothed sector, whereby, along the entire line of interaction of the toothed sector with the satellite gears, a zone of winding of the weft thread is formed; a device for retaining said winding members in a preset position after the satellite gears disengage from said toothed sector including a stationary fixing sector installed diametrically opposite said toothed sector and lugs mounted on said satellite gears and cooperating, when the latter are shifted by said disk, with the periphery of the fixing sector; a device for gradual starting of



the winding members and stopping them in a predetermined position including two cams, one of which is intended for gradual starting of said satellite gears with the winding members and is stationary above the portion wherein the satellite gears change over from the fixing sector to said toothed sector and the other cam is intended for gradual stopping of said satellite gears with the winding members and is stationary above the portion wherein the satellite gears change over from said toothed sector to the fixing sector, and a plurality of pairs of pins according to the number of said winding members, each pair being mounted on each said satellite gear, one pin of the pair being adapted to cooperate with the cam for starting at the beginning of winding of the weft thread, and the other pin of the pair being adapted to cooperate with the cam for stopping at the end of winding of the weft thread onto the spools of the carriers.

4,202,384

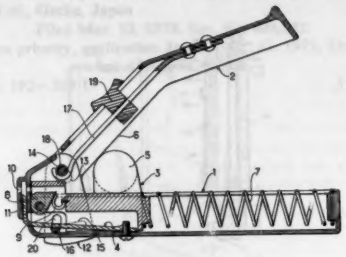
AUTOMATIC DEVICE FOR INSTALLING SELF-LOCKING STRAPS

René Aubert, Pont-A-Mousson, France, assignor to Societe d'Usinage des Tubes pour l'Electricite S.U.T.E., Pont-A-Mousson, France

Filed Jan. 18, 1979, Ser. No. 4,511
Claims priority, application France, Feb. 1, 1978, 78 02735
Int. Cl.[2] B21F *9/02*
U.S. Cl. 140—123.6 **12 Claims**

1. An automatic device for installing self-locking binder straps, said device comprising: two handles, means for assembling said handles so as to allow rotation of said handles relative to each other; a moving component carried by one of said handles and gripping the end of the strap in such a way that the relative movement of the handles tightens the strap; a cutter blade carried by one of said handles for cutting operation when the strap is tightened to a predetermined extent; the improvement wherein said moving component is biased to a first position by resilient return means, said moving component which slides on a first handle has a cam portion in contact with the adjacent edge of the second handle so that said handles when moving towards each other moves said moving component in translation in opposition to said resilient return means, the second handle has an actuating component for the cutter blade which is fixed to the first handle such that said actuating com-

ponent operates automatically when said moving component has reached a position which corresponds to the predetermined tightening of the collar due simply to the second handle bearing on the cam portion of said moving component.

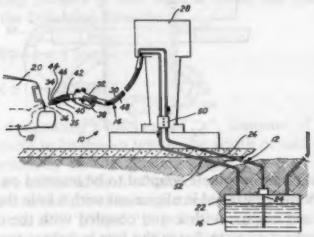


4,202,385

LIQUID DISPENSING, VAPOR RECOVERY SYSTEM

Frederick L. Voelz, Orland Park, and Roy G. Jewell, Country Club Hills, both of Ill., assignors to Atlantic Richfield Company, Philadelphia, Pa.

Filed Feb. 14, 1978, Ser. No. 877,645
Int. Cl.² B65B *31/00*
U.S. Cl. 141—59 **11 Claims**



1. An improved hybrid liquid dispensing, vapor recovery system for utilization in association with a liquid source and a liquid receiver, said system comprising, in combination:

a liquid dispensing subsystem having a liquid dispensing line for intermittently delivering liquid from said liquid source through said dispensing line to said liquid receiver; and

a vapor recovery subsystem including,

a collector means for collecting vapor from said liquid receiver, said collector means mounted in association with said dispensing subsystem for collecting vapor whenever said dispensing subsystem delivers liquid to said liquid receiver,

a recovery line in vapor communication with a vapor space of said liquid source and with said collector means,

means mounted on a first shaft transverse to a passageway in vapor communication with said recovery line for impelling the vapor in said recovery line toward said liquid source, and

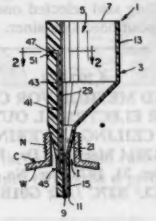
means for driving said impelling means, said driving means operably connected by means of a magnetic coupling to said impelling means and mounted on a second shaft in a passageway in communication with said dispensing line for generating kinetic energy from the flow of liquid in said dispensing line.

4,202,386

OVERFILL PREVENTIVE FUNNEL

Brian A. Orr, 1780 Dean Park Rd., Sidney, British Columbia, Canada

Filed May 3, 1978, Ser. No. 902,561
Claims priority, application Canada, Apr. 4, 1978, 300401
Int. Cl.² B65B *39/04*
U.S. Cl. 141—300 **6 Claims**



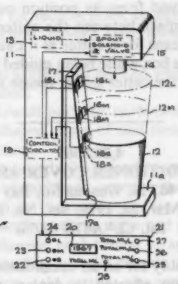
1. A funnel having: a large bowl with a large liquid inlet at one end; a spout projecting from the other end of the bowl with a small liquid outlet at its free end; means located on the spout end of the funnel for making a substantially air-tight connection with the inlet of a container to be filled; first and second separate vent means formed in the wall of said spout and said bowl by-passing the connecting means; said first vent means having a first opening in the outer surface of the wall of the spout and a second opening in the interior surface of said bowl; the second vent means having a first opening in the outer wall of said spout free to atmosphere and a second opening on the exterior wall of said bowl, the first opening of the first vent means being located nearer to the free end of the spout than the first opening of the second vent means and the second opening of the second vent means being arranged for manual control to selectively occlude the same.

4,202,387

FLUID DISPENSING CONTROL SYSTEM

Douglas J. Upton, 18740 Devonshire, Northridge, Calif. 91324

Filed Aug. 10, 1977, Ser. No. 823,228
Int. Cl.² B65B *3/04*
U.S. Cl. 141—360 **16 Claims**



1. A fluid dispensing control system comprising:

a fluid dispenser having a housing and electrically operated valve means, mounted in said housing, for dispensing a fluid into a container;

sensor means for providing a selected one of a set of signals respectively indicative of the sizes of containers to be filled by said dispenser;

valve control timer means, connected to said sensor means and to said valve means and responsive to said selected one signal, for opening said valve means for the period of

time requisite to fill a container of the size indicated by said selected one signal;

said sensor means comprises a set of light sources and associated photosensors mounted on said housing in respective locations such that when a container is positioned to be filled by said fluid dispenser, said positioned container will reflect light from said sources into a particular subset of said photosensors indicative of the size of said container; and

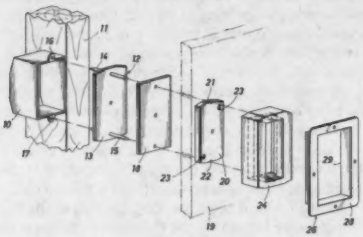
circuit means, responsive to the outputs of said photosensors, for providing said selected one signal indicative of the size of the positioned container.

4,202,388

APPARATUS AND METHOD FOR CUTTING ACCESS OPENINGS FOR ELECTRICAL OUTLET BOXES IN WALL OR CEILING COVERING PANELS

James H. Wieting, 12914 Memorial Dr., Houston, Tex. 77079

Filed Oct. 31, 1978, Ser. No. 956,183
Int. Cl.[2] B27C *1/00*; G01B *5/14*
U.S. Cl. 144—323 **6 Claims**



1. Apparatus for guiding a cutter as it cuts an opening in a wall or ceiling covering panel to receive an electrical outlet or switch box comprising locator means for mounting on the box for extending through the portion of the panel to be cut away in a pre-determined position relative to the box, cutter spacer means for attaching to the panel in a pre-determined position relative to the locator means, cutter guide locator means for positioning on the cutter spacer means, cutter guide means for positioning on the cutter guide locator means, means for attaching the cutter guide means to the panel when positioned on the cutter guide locator means to allow the cutter guide locator means to be removed from its position on the cutter spacer means to provide space between the cutter spacer means and the cutter guide means for a cutter as it cuts an opening in the panel to receive the box while being guided by the cutter guide means and held by the cutter spacer means to a pre-determined depth of cut.

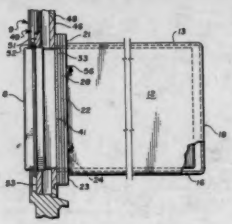
4,202,389

AIR CONDITIONER COVER ASSEMBLY

Marguerite Ewald, 402 N. Wenona St., Bay City, Mich. 48706

Filed Mar. 26, 1979, Ser. No. 23,639
Int. Cl.[2] A47B *81/00*
U.S. Cl. 150—52 R **10 Claims**

1. A cover assembly for an air conditioning unit of the type which has a portion adapted to project outwardly from a chamber wall opening, said assembly comprising a cover member having an imperforate outer end wall and imperforate peripheral side, top and bottom walls forming a complete outer enclosure for the projecting portion of such a unit, said side, top and bottom walls having inner edges providing a cover-supporting flange surrounding such an air conditioning unit close to such a chamber wall, an intermediate adapter frame dimensioned to surround such unit and having inner and outer support surfaces adapted to face respectively toward and away from such chamber wall when assembled, the outer adapter frame surface being sized to fit the supporting flange of the cover member, and the inner adapter surface being adapted to fit around such a chamber wall opening, first fastening means for securing the intermediate adapter frame in relatively fixed and sealed engagement against such chamber wall around the



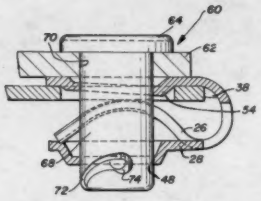
chamber wall opening, and cooperating fastening means on the cover member and intermediate adapter frame for convenient selectively-removable sealing connection of the cover member to the adapter frame.

4,202,390

SLIP-ON RECEPTACLE

Peter Schenk, West Islip, N.Y., assignor to Dzus Fastener Co., Inc., West Islip, N.Y.

Filed Apr. 26, 1978, Ser. No. 900,142
Int. Cl.[2] F16B *37/04*
U.S. Cl. 151—41.75 **11 Claims**



1. A slip-on receptacle adapted to be inserted on one of two members to be fastened in alignment with a hole therein and to receive and engage with a stud coupled with the other of the two members so as to fasten the two members together comprising:

a base portion with an opening therein;

at least one resilient mounting leg extending from the base into overlying and spaced relationship with respect thereto so as to receive the one member therebetween to mount the receptacle thereon in position with the opening in the base aligned with the opening in the one member;

a resilient receptacle leg extending from the base into overlying relationship with respect thereto and being spaced from the base a predetermined distance to permit the one member to be inserted therebetween;

the receptacle leg having an opening therein and stud engagement means fixed on said receptacle leg in position for alignment with the opening in the one member and the base when the receptacle is mounted on the one member to receive the stud coupled with the other member and interengaged therewith to hold the members together; and

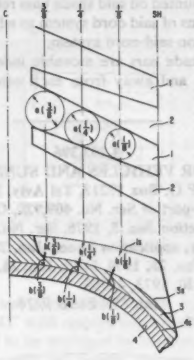
the receptacle leg and each mounting leg adapted to act independently with the resilient mounting leg accommodating dimensional width variations of the one member and the receptacle leg and stud engagement means being a fixed distance from the side of the one member engaged by the base independent of the width dimension of the one member to provide for a stud grip length that does not change as a function of the width of the one member.

4,202,391

TIRE FOR CONSTRUCTION VEHICLES

Toshiyuki Shibayama, Toyonaka, and Kenji Nakakura, Nishinomiya, both of Japan, assignors to The Toyo Rubber Industry Co., Ltd., Osaka, Japan

Filed Mar. 13, 1978, Ser. No. 885,632
Claims priority, application Japan, Mar. 12, 1977, 52-27351
Int. Cl.[2] B60C *11/06*
U.S. Cl. 152—209 D **3 Claims**



1. A bias ply tire for high-speed construction vehicles of a standard size of 16.00–25 or larger and a wide base size of 20.5–25 or larger including a lug type, a semi-lug type and a block type with a ratio of 60–75 percent of an area of contact portion of a tread to an area of said tread wherein the size of said projecting portion of said tread is under the conditions defined by the following formulas:

$1.0 \leqq K \leqq 1.3$ at $\frac{1}{8}$ point

$1.0 \leqq K \leqq 1.6$ at $\frac{1}{4}$ point

Said "k" designating a quotient of "a", diameter of a maximum circle to be drawn within the width of said projecting portion, by "h" designating height of grooves in said tread at a center of each of said circle along a line perpendicular to a surface of an undertread at a center of each of said circle, and "$\frac{1}{8}$" and "$\frac{1}{4}$" points designating a dividing point respectively $\frac{1}{8}$ and $\frac{1}{4}$ of the width of a flat projection of said tread from an end of said tread.

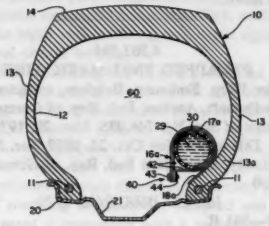
4,202,392

PNEUMATIC TIRE AND FLUID RESERVOIR ASSEMBLY

Mark H. Mineur, and Robert L. Toth, both of Cuyahoga Falls, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Mar. 17, 1978, Ser. No. 887,691
Int. Cl.[2] B60C *17/00*
U.S. Cl. 152—330 L **22 Claims**

1. A fluid reservoir adapted for cooperation with a pneumatic tire, said reservoir comprising a hollow body for containing a fluid under pressure; a first valve means connecting the interior and exterior of said body for charging and pressurizing of said body; and a second valve means connecting the interior and exterior of said body, said second valve means including a hollow housing, pressure responsive means set in said housing, temperature responsive means in said housing and contained by said pressure responsive means, said temperature responsive means being responsive at a predetermined temperature, said temperature responsive means contributing to the support of said pressure responsive means at temperatures less than said predetermined temperature; said second valve means being normally closed and said second valve means being set to open to release said fluid contained within said body upon co-existence of both a predetermined pressure



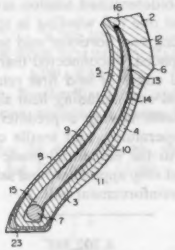
differential between the interior and exterior of said body and an ambient temperature of at least a predetermined temperature.

4,202,393

RUN FLAT TIRE FOR MOTORCYCLES

Ryo Ikeda; Yoichi Nogami, and Teruo Koizumi, all of Hiratsuka, Japan, assignors to The Yokohama Rubber Co., Ltd., Tokyo, Japan

Filed Jul. 26, 1978, Ser. No. 928,162
Claims priority, application Japan, Aug. 1, 1977, 52/92452
Int. Cl.[2] B60C *17/00*
U.S. Cl. 152—330 RF **8 Claims**



1. A run flat tire for motorcycles, comprising:

(A) a tread portion having two shoulder-shaped edges thereof;

(B) a pair of bead portions in each of which an annular bead core is embedded,

(C) a pair of sidewall portions each extending from one of the shoulder-shaped edges of said tread portion to one of said bead portions,

(D) a carcass composed of (a) a main portion thereof extending from one of said bead cores to the other one thereof and embedded in the inside surface layer of said bead portions, sidewall portions, and tread portion and (b) two end portions thereof, each turned up around the bead core and, then, extending into the outside surface layer of said sidewall portion, said carcass ply containing at least one tire cord fabric, and

(E) a pair of sidewall-reinforcing layers, each comprising:

(1) an elastic filler extending from an end location adjacent said bead core to the other end location in said tread portion and embedded in said bead portion, sidewall portion and tread portion, said elastic filler having an elastic modulus of from 40 to 75 kg/cm, at an elongation of 100% and a Shore hardness of from 70 to 90, and

(2) at least one reinforcing ply extending along one side surface of said elastic filler toward said tread portion, turned up around the end of said elastic filler in said

tread portion and then further extending along the other side surface of said elastic filler toward said bead portion, said reinforcing ply containing at least one tire cord fabric.

4,202,394

RECAPPED PNEUMATIC TIRE

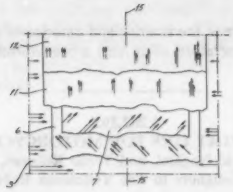
Sjirk van der Burg, Embourg, Belgium, assignor to Uniroyal Aktiengesellschaft, Aachen, Fed. Rep. of Germany

Continuation of Ser. No. 746,035, Nov. 29, 1976, Pat. No. 4,135,565. This application Oct. 23, 1978, Ser. No. 953,385

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1975, 2556930

Int. Cl.[2] B60C *9/18, 9/20*

U.S. Cl. 152—361 R **10 Claims**



1. A recapped pneumatic tire construction comprising a used tire body having a radial carcass and a first circumferential reinforcement belt formed with steel cords at angles between 10° and 30°, a stripped circumferential recapping surface at the periphery of said used tire body, a second reinforcement belt wound under a predetermined tension around said recapping surface for at least one full winding in spiral arrangement to provide overlapping end portions, said second reinforcement belt comprising spaced, unconnected marginal strips overlapping the marginal edges of said first reinforcement belt and being unvulcanized and including heat shrinkable rubberized textile cord elements having a predetermined shrinkage at vulcanization temperatures, said textile cord elements being oriented parallel to the equatorial plane of the tire, and an unvulcanized trend strip applied around said recapping surface over said second reinforcement belt.

4,202,395

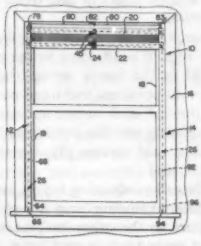
ADJUSTABLE SHADE CONSTRUCTION

Richard A. Heck, West Bloomfield, and David J. Dekker, Birmingham, all of Mich., assignors to Sundberg-Ferar, Inc., Southfield, Mich.

Filed Sep. 11, 1978, Ser. No. 941,547

Int. Cl.[2] E06B *3/94*

U.S. Cl. 160—84 R **20 Claims**



1. In an adjustable shade or screen construction mountable upon a supporting structure, the combination comprising

a pair of spaced apart, independently manually adjustably movable shade bars,

a pair of rollers rotatably disposed in each end of said shade bars, in planes parallel to the direction of movement of said shade bars,

a shade or screen member secured to and disposed intermediate said shade bars.

said shade or screen member being relatively flexible, compactable and expandible between said shade bars,

a parallelogram cord system secured to said supporting structure and engaging said shade bars about selected portions of said rollers,

and means mounted on said shade bars releasably engageable with portions of said cord system to adjustably secure said shade bars on said cord system,

whereby said shade bars are movable independently and adjustably toward and away from each other upon said cord system.

4,202,396

MOTOR VEHICLES AND SUNSHIELDS

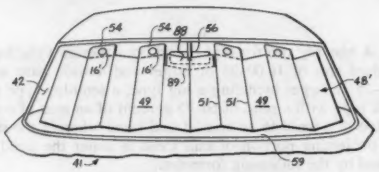
Abraham Levy, P.O. Box 17212, Tel Aviv, Israel (69690)

Continuation-in-part of Ser. No. 409,920, Oct. 26, 1973. This application Jun. 5, 1978, Ser. No. 912,653

Claims priority, application Israel, Jun. 20, 1973, 5668; Jun. 20, 1973, 5669; Jun. 28, 1978, 5672; Jun. 28, 1973, 5673; Jul. 9, 1973, 5679; Jul. 20, 1973, 42796

Int. Cl.[2] E06B *9/24*

U.S. Cl. 160—107 **26 Claims**



1. In a motor vehicle, the improvement comprising in combination:

a window having an outside, an inside, an upper margin and a lower margin;

a foldable sunshield having a plurality of planar rectangular elements fabricated from substantially rigid sheet material and jointed to each other along longitudinal edges thereof, said sunshield having a compressed position for storage in a package and a stretched position at the inside of said window wherein the planar rectangular elements extend along and away from the lower margin of the window and said longitudinal edges extend at right angles to the lower margin of the window; and

means for releasably retaining the sunshield at the window against the force of gravity while said longitudinal edges extend at right angles to the lower margin of the window.

4,202,397

METHOD OF CONTINUOUSLY CASTING MOLTEN METAL

Joseph W. Hlinka; Bruce C. Whitmore, and Mustafa R. Ozgu, all of Bethlehem, Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Jan. 20, 1975, Ser. No. 542,480

Int. Cl.[2] B22D *11/10*

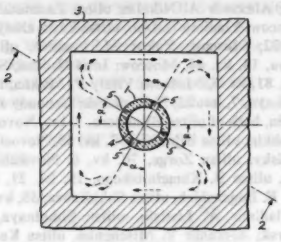
U.S. Cl. 164—82 **2 Claims**

1. A process for the continuous casting of moten metal into billets or blooms comprising:

introducing a submergible nozzle having a central longitudinal axis into a vertically oriented rectangular open-ended continuous casting mold, said submergible nozzle being provided with at least four nozzle outlets radially disposed from said central longitudinal axis and said open-ended continuous casting mold being dimensioned such that, in horizontal cross section, the ratio of the lengths of one

opposed pair of mold walls to the lengths of the other opposed pair of mold walls is approximately between one to one and one to two;

introducing molten metal into said nozzle and through said nozzle outlets to establish at least four cooperating fixed streams of molten metal below the surface of a pool of molten metal continuously maintained in said mold with at least one stream being directed toward each mold wall, each nozzle being designed such that each of said streams is directed in a substantially straight line obliquely toward



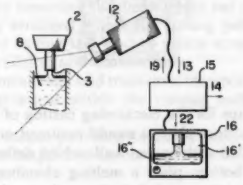
a mold wall and each nozzle outlet being angled from between 15°–43° with respect to a plane perpendicular to the mold wall to be impinged by the stream flowing from a particular nozzle and passing through the midpoint of the length of the mold wall to be impinged so that each of the streams strikes a mold wall in that portion of the mold wall between the midpoint of the length of the mold and wall adjacent corner, whereby the streams cooperate to produce a non-interfering unidirectional circulatory flow of molten metal circumferentially along the perimeter of said mold in the upper portion of said molten metal pool.

4,202,398

MOLTEN METAL SURFACE LEVEL DETECTION SYSTEM

Kozo Osugi, Tokyo, Japan, assignor to Furukawa Metals Co. Ltd., Tokyo, Japan

Filed Nov. 13, 1978, Ser. No. 959,643
Int. Cl.² B22D *11/16*
U.S. Cl. 164—150 **1 Claim**



1. An apparatus for detecting the level of poured molten metal in the liquid phase to eliminate false signals caused by flames and other signal-noise producing factors, comprising in combintion:

(a) an ITV camera which can be placed at some distance from the liquid level to be detected so as to photograph the level of said liquid metal surface including signal circuit means (13) for supplying an input signal;

(b) a reference frequency oscillator with first and second output sides;

(c) a signal generator (18) coupled to said first side of the reference frequency oscillator (17), said signal generator (18) being connected to the camera (12) for generating horizontal and vertical synchronizing signals (19) supplied to said camera (12);

(d) an image screen (16') connected to a picture element divider circuit (20), said picture element divider circuit (20) being coupled to said second output side, and serving to divide said screen (16') into a plurality of rectangular picture elements each being a defined zone along a first and a second axis normal to each other, said screen (16') having an input end receiving said input signal (13) from said signal circuit means;

(e) an amplifier clamping circuit (27) connected to said input signal end (13), a comparator circuit (28) including reference supply means connected to said clamping circuit (27), a discriminator (29) for supplying gate pulses connected to said comparator circuit (28) so that a gate pulse is supplied each time that an element correction to the aforementioned picture elements is scanned so that a plurality of scanning elements are sampled and the level of each element is compared with a reference provided by said reference supply means to provide an output either less than said reference or equal or more than said reference;

(f) a memory (30) connected to said discriminator (29) to temporarily store the output of the discriminator (29);

(g) a dynamic controller (31) coupled to said memory (30) said dynamic controller (31) generating and providing a sampling pulse to the memory (30) so that the output of the discriminator (29) is fed only at predetermined time periods to said memory (30); and,

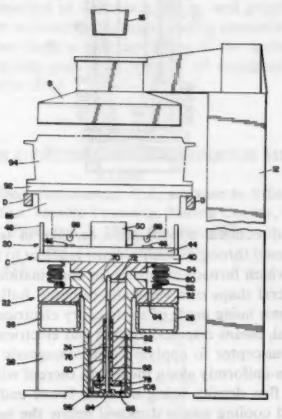
(h) an output level control circuit (32) connected to said memory for controlling the level of the molten liquid when the number of scanned elements having a value equal to or more than said reference exceeds a predetermined number so as to eliminate random signals caused by flame and other noise making materials causing only a random output equal or greater than said reference.

4,202,399

SUPPORT TABLE FOR FOUNDRY SAND MOLDING APPARATUS

Edward D. Abraham, Brecksville, Ohio, and Rodney L. Hartung, Muscatine, Iowa, assignors to Carver Foundry Products, Muscatine, Iowa

Filed Mar. 20, 1978, Ser. No. 888,380
Int. Cl.² B22C *15/30*
U.S. Cl. 164—203 **6 Claims**



1. A foundry sand molding apparatus comprising a vertically movable upper table structure, said upper table structure adapted to support a flask thereon, a base structure including a support portion for engaging said upper table structure in the lower position of said upper table structure and means for guiding said upper table structure for vertical movement along the vertical axis of said upper table structure, air motor menas

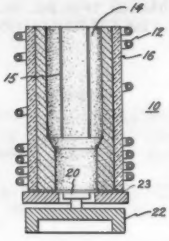
for elevating said upper table structure vertically from the lowermost position to a sand supply position whereat sand is supplied to the flask, means including said motor means for lowering said upper table structure from said supply position to a preset position slightly elevated above said support portion, vibrator means mounted on said upper table structure for vibrating the same and the flask when said upper table structure is slightly elevated above said lowermost position and out of contact with said support portion, and said air motor means being further operative to elevate said upper table structure from said preset position to a sand squeezing position, spring means for acting between said base structure and said upper table structure for applying an upward force to said upper table structure to aid said air motor means in positioning said upper table structure to said preset position slightly elevated above said lowermost position and means for causing said spring means to apply said upward force in response to downward movement of said upper table structure into a position adjacent said preset position.

4,202,400

DIRECTIONAL SOLIDIFICATION FURNACE

Michael F. X. Gigliotti, Jr., Scotia, and Thomas F. Sawyer, Ballston Lake, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 22, 1978, Ser. No. 944,892
Int. Cl.[2] B22D 27/02
U.S. Cl. 164—251 5 Claims



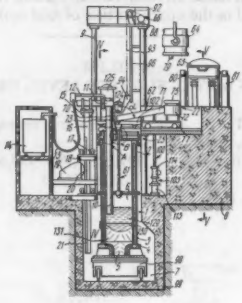
1. In a directional solidification furnace in which molten metal is passed through a temperature gradient to initiate solidification, which furnace comprises in combination a susceptor in the general shape of a vertically-disposed hollow cylinder, said susceptor being made of a refractory electrically conducting material, means disposed around and electrically insulated from said susceptor fo applying electromagnetic flux density thereto non-uniformly along the length thereof with the region of highest flux density being near the lower end of said susceptor, and cooling means disposed below the bottom end of said susceptor, the improvement wherein the wall of said susceptor has at least one elongated slot passing completely through the thickness of said wall, initiating at the top of said wall, and extending longitudinally therealong to terminate intermediate the top and bottom ends of said susceptor at a distance above said bottom end, which leaves said lower end of said susceptor wall intact in said region of highest flux density.

4,202,401

APPARATUS FOR ELECTROSLAG CASTING OF HEAVY INGOTS

Jury V. Latash, ulitsa Artema, 55, kv. 23; Alexei E. Voronin, ulitsa Prazhskaya, 3, kv. 426; Vladimir A. Nikolaev, ulitsa Vernadskogo, 61, kv. 75, all of Kiev; Boris B. Pelts, ulitsa Lesnaya, 63/43, kv. 57, Moscow; Lev A. Volokhonsky, ulitsa Mostnaya, 50-a, kv. 7, Moscow; Vladimir D. Artemiev, Leningradsky prospekt, 14, kv. 78, Moscow; Mikhail I. Vlasov, prospekt Mira, 124, korpus 10, kv. 277, Moscow; Alexandr I. Chernyak, ulitsa Verkhnyaya Khokhlovka, 39/47, kv. 53, Moscow; Alexandr A. Nikulin, ulitsa Znamenskaya, 35, kv. 112, Moscow; Vladimir S. Dub, ulitsa Festivalnaya, 14, korpus 3, kv. 372, Moscow; Yakov M. Vasiliev, ulitsa admirala Makarova, 14, kv. 44, Moscow; Iosif N. Stul, Sevastopolsky prospekt, 81, kv. 5, Moscow; Vitaly P. Mukha, ulitsa 1 Mekhanicheskaya, 7, kv. 22, Novosibirsk; Gennady I. Orlov; Kim M. Khasin, both of ulitsa Bljukhera, 7, kv., Novosibirsk; Jury A. Naryshkin, ulitsa Bljukhera, 7, kv. 53, Novosibirsk; Valentin I Belsky, ulitsa Zorge, 70, kv. 6, Novosibirsk; Ilya L. Veligura, ulitsa B. Khmelnitskogo, 15, kv. 21, Kramatorsk; Vladimir E. Bogdashich, ulitsa Shkidinova, 55, kv. 34, Kramatorsk; Vladimir A. Lisitsin, ulitsa Shkolnaya, 3, kv. 44, Kramatorsk; Alexandr V. Mischenko, ulitsa Kurchenko, 15, kv. 9, Kramatorsk; Jury A. Kovalenko, ulitsa Parkovaya, 27, kv. 38, Kramatorsk; Vladimir V. Babin, ulitsa Krasny Kazanets, 9, korpus 2, kv. 136, Moscow; Igor A. Svitenko, Teplystan, 5 mikroraion, korpus 61, kv. 149, Moscow; Vladimir I. Antonov, ulitsa Petukhova, 26, kv. 47, Novosibirsk, and Volemir D. Smolyarenko, Kutuzovsky prospekt, 19, kv. 136, Moscow, all of U.S.S.R.

Filed Feb. 22, 1978, Ser. No. 880,062
Int. Cl.[2] B22D 27/02
U.S. Cl. 164—252 9 Claims



1. An apparatus for the electroslag casting of heavy ingots comprising: a bottom plate; a mould mounted on said bottom plate and provided with cooled walls which define in conjunction with said bottom plate a melting chamber, the cooled walls extending substantially continuously to the top of the melting chamber; a roof removably mounted on said mould so as to close the melting chamber; means for sealing the junction between said roof and said mould; a gas exhaust pipe; input funnels for feeding slag and alloying admixtures, said roof having openings formed therein for sealingly receiving the gas exhaust pipe and the input funnels for feeding slag and alloying admixtures to the melting chamber; a liquid metal pouring system incorporating a metal conduit removably mounted in an opening in said roof along the symmetry axis of said mould and provided with a funnel disposed in the upper portion of said metal conduit; an inclined chute mounted above said funnel of said metal conduit for movement in the horizontal plane; non-consumable electrodes arranged in apertures of said roof around the circumference of the melting chamber for vertical movement; sealing means for sealing the junctions between said roof and said nonconsumable electrodes; a power

source electrically connected to said non-consumable electrodes; first manifold means positioned in the region of the mounting of the metal conduit to the roof for blowing a neutral gas into the mounting region, and second manifold means surrounding a discharge end of said inclined chute for blowing a neutral gas into a region between the discharge end and the funnel.

4,202,402

TRANSFER DEVICE FOR BILLETS AND BLOOMS OF A MULTISTRAND CONTINUOUS CASTING INSTALLATION FOR METALS

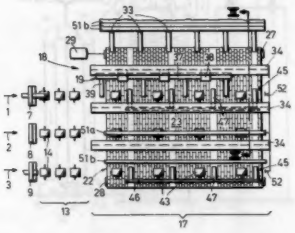
Adalbert Röhrig, Wädenswil, Switzerland, assignor to Concast AG, Zürich, Switzerland

Filed Sep. 19, 1977, Ser. No. 834,578

Claims priority, application Switzerland, Oct. 7, 1976, 12688/76

Int. Cl.² B22D *11/08*

U.S. Cl. 164—263 **2 Claims**



1. A transfer or outfeed device for castings, in particular billets or blooms of a multistrand continuous casting installation for metals, especially steel, comprising:

means, defining cutting stations arranged within cutting paths for the continuously cast strands, for cutting-to-length such cast strands;

means for removing dummy bars out of transfer lines of the cast strands;

storage means for storing the dummy bars;

transverse transport means, being arranged below the transfer lines, for transporting the cut-to-length hot cast strands;

said means for removing the dummy bars out of the transfer lines being arranged within the cutting paths of the hot strands and having said storage means arranged approximately parallel to said transfer lines;

said storage means and said transverse transport means being partially arranged within the cutting paths of the hot strands;

pivotal lever means, provided for each strand, for depositing each cut-to-length hot strand upon the transverse transport means;

said pivotal lever means each having a free end and, in a starting position of each said pivotal lever means, said free end thereof possesses a respective approximately horizontal support surface and, in a pivotal position thereof, a respective tilting surface for each cut-to-length hot strand, said tilting surface being directed upwardly at an inclination.

4,202,403

ROLLOVER CLOSER

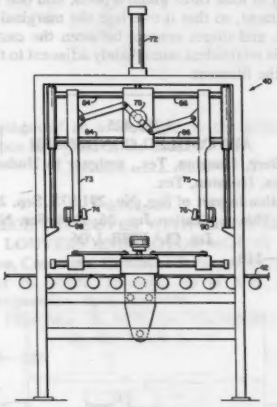
Charles R. Miller, Bedford, Ohio, assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Apr. 21, 1978, Ser. No. 898,586

Int. Cl.² B22C *17/08*

U.S. Cl. 164—409 **1 Claim**

1. Mold making apparatus including a conveyor belt, placement means for placing a flaskless cope on the belt with the pattern-side up, control means for periodically moving the belt longitudinally a given distance, said placement means adapted for thereafter placing a flaskless drag on the belt, with the pattern-side up, behind the cope, a rollover closer positioned at a location along the conveyor belt, said rollover closer including centering means to center a cope from side-to-side, and longitudinally, about an indexing point on the belt, lifting means to thereafter lift the cope and rotate it 180°, holding it centered above the indexing point, the control means adapted for thereafter moving the belt to bring a drag into the rollover closer, said centering means adapted for then centering the drag from side-to-side and longitudinally about said indexing



point on the belt, so that the drag is directly beneath the cope, said lifting means adapted for then lowering the cope onto the drag, thereby forming a finished mold ready for pouring, the centering means including moveable closer arms that contact the cope or drag on all four sides, to move the cope or drag so as to be centered with respect to said indexing point, motor means for moving the arms, the arms each being made up of a pair of pivotally connceted links, with one end of one of the links being connected to the motor means, and gripping pads for engagement with either the cope or drag connected to one end of the other link, so that actuation of the motor means moves the gripping pads into and out of engagement with either the cope or drag.

4,202,404

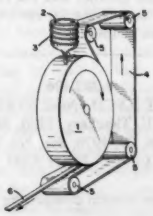
CHILL ROLL CASTING OF AMORPHOUS METAL STRIP

Charles E. Carlson, Succasunna, N.J., assignor to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Jan. 2, 1979, Ser. No. 453

Int. Cl.² B22D *11/00*

U.S. Cl. 164—423 **8 Claims**



1. In an apparatus for the production of continuous metal

strip by depositing molten metal onto the peripheral surface of a rapidly rotating annular chill roll, said apparatus including an annular chill roll adpated for rapid rotation around its longitudinal axis having a flat peripheral casting surface, and means for depositing molten metal onto said casting surface for rapid solidification thereon to form a continuous metal filament, the improvement which comprises provision of an elastomeric, flexible belt being carried in frictional engagement with said casting surface in an arcuate portion of at least 120° around said chill roll beginning at a point upstream from the point where the filament would be flung away from the casting surface by action of centrifugal force, adapted to urge said solidified filament into contact with said casting surface, said belt being supported by at least three guide wheels, said belt being wider than the filament, so that it overlaps the marginal portions of the filament, and direct contact between the casting surface and the belt is established immediately adjacent to the marginal portions of the filament.

4,202,405

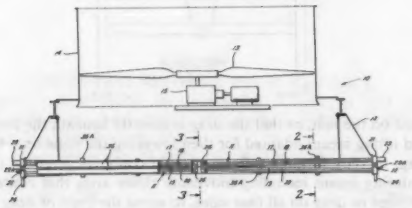
AIR COOLED CONDENSER

William F. Berg, Houston, Tex., assignor to Hudson Products Corporation, Houston, Tex.

Continuation-in-part of Ser. No. 291,673, Sep. 25, 1972, abandoned. This application Jun. 26, 1974, Ser. No. 483,145

Int. Cl.[2] F28B *1/06*

U.S. Cl. 165—110 **3 Claims**



1. An air cooled condenser for condensing steam or other substantially single component vapor at a pressure near or below atmospheric, comprising a generally upright housing which is open at its upper and lower ends to permit air flow upwardly therethrough, at least one tube bundle mounted generally horizontally within the housing, each having vertically successive, generally horizontal rows of tubes arranged in the direction of air flow therepast, whereby the tubes of the lowermost and uppermost rows are respectively the first and last to be contacted by the air, and the tubes of the rows adjacent to those of each of the first and last to be contacted are the second and next to last to be contacted, respectively, an inlet header adapted to receive the vapor at one end of the bundle and connecting with the tubes of the uppermost row and the row adjacent thereto, a common outlet header at said one end of the bundle connecting directly with the tubes at the lowermost row and the row adjacent thereto for receiving condensate and uncondensed vapor therefrom, means at the other end of the bundle connecting the tubes of said lowermost and uppermost rows to one another and the tubes of said adjacent row to one another, and means for reversing the direction of air flow past the rows of tubes.

4,202,406

HEAT EXCHANGE SYSTEM

Alfred J. Avery, 113 E. Thackery, Flint, Mich. 48505

Filed Jun. 29, 1978, Ser. No. 920,353

Int. Cl.[2] F24H *3/00*

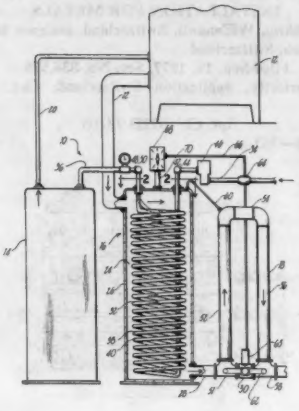
U.S. Cl. 165—47 **9 Claims**

1. A heat exchanger system comprising

a fluid

a heat exchange tank having an outer housing which encloses an inner chamber and having a coil of tubing disposed in said chamber, said tubing having an inlet portion and an outlet portion both of which extend exteriorly of said tank, and said housing having inlet and outlet portions which communicate with said chamber,

a fluid trap communicating with the outlet of said heat exchange tank housing to receive fluid from the chamber and elevate it to a height sufficient to provide adequate fluid pressure in the chamber to maintain the fluid in the chamber at substantially the same height as the top of said coil,



a fluid supply tank having means for heating the fluid disposed therein and communicating with the outlet of said coil,

means for extracting and utilizing the fluid from said fluid heater supply tank,

a first pipe communicating with said last-mentioned means to transfer the used fluid from said last-mentioned means to the inlet of said heat exchanger tank housing, and

means for providing fluid from an external source and introducing it into the inlet of said coil.

4,202,407

APPARATUS FOR COOLING GASES FROM COKE PLANTS

Friedhelm Woitowitz, Hattingen, Fed. Rep. of Germany, assignor to Didier Engineering GmbH, Essen, Fed. Rep. of Germany

Filed Jul. 24, 1978, Ser. No. 927,042

Int. Cl.[2] F28F *9/26*

U.S. Cl. 165—76 **8 Claims**

1. A heat exchange apparatus, particularly for use in cooling gas from coke plants, said apparatus comprising:

a base housing section having a hollow interior, an open upper end, and gas connection means opening into said interior;

a head housing section having a hollow interior, an open lower end, and gas connection means opening into said interior;

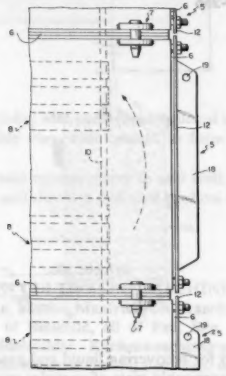
a plurality of separate hollow intermediate housing sections stacked one above the other, in a gas-tight but readily removable manner, between said base housing section and said head housing section, said head housing section, said intermediate housing sections and said base housing section being joined to each other in a pressure-tight manner solely by the weight of upper of said sections resting on lower of said sections, said intermediate housing sections having open upper and lower ends, such that the interiors of said intermediate housing sections are in alignment and

in open communication with said interiors of said base housing section and said head housing section;

plug-in alignment means on said head housing section, said intermediate housing sections and said base housing section providing an accurate vertical alignment of said sections when said sections are stacked one above the other;

each said intermediate housing section having extending transversely and substantially horizontally across the interior thereof at least one group of a plurality of heat exchange tubes, the interiors of said tubes being isolated from the interiors of said intermediate housing sections;

heat exchange fluid connection means connected to the uppermost and lowermost of said groups of tubes for the passage therethrough of heat exchange fluid;



each said intermediate housing section comprising a pair of spaced side walls, a pair of spaced tube plates having opposite ends attached to said side walls, said tubes extending between said tube plates, with opposite ends of said tubes extending through said tube plates, said side walls each having portions extending beyond said tube plates, and end walls attached in a pressure-tight and detachable manner to said opposite ends of said side walls, said end walls, said tube plates and said portions of said side walls together forming vertically extending ducts at said opposite ends of said tubes; and

said ducts comprising connecting means for connecting adjacent ends of adjacent of said groups of tubes such that said heat exchange fluid passes through said tubes of said intermediate housing sections in a substantially sinusoidal manner.

4,202,408

JET TYPE HEAT EXCHANGER

Robert S. Temple, P.O. Box 562, West Acton, Mass. 01720

Filed Mar. 6, 1978, Ser. No. 883,875

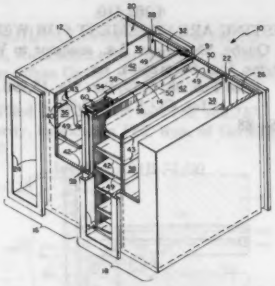
Int. Cl.[2] F28F *13/12*

U.S. Cl. 165—109 **18 Claims**

1. A heat exchanger including a heat transfer sheet dividing an enclosure into a hot side and a cold side each having a jet nozzle for directing a jet of fluid generally perpendicularly against the respective side of said sheet, said exchanger being characterized in that:

said heat transfer sheet comprises a thin pleated sheet of thermally conductive material, the pleats having generally planar sides which diverge and form interior angles of not more than about 10° and the tips of the pleats lying in planes generally perpendicular to the direction of flow of the jets of fluid; and,

each of said nozzles is positioned relative to said sheet such that fluid of the jet from the nozzle is directed between



and impinges of an acute angle on the generally facing planar side of a pleat of the sheet.

4,202,409

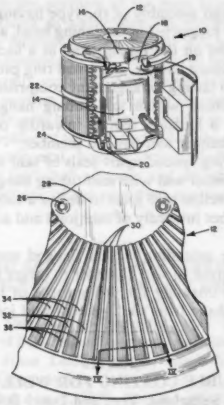
ONE PIECE TOP COVER WITH STAMPED OPEN LOUVERS AND MOTOR MOUNT

Peter L. Cann, Canastota; Richmond S. Hayes, Jr., Fayetteville, and Lester N. Miller, Syracuse, all of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Mar. 23, 1978, Ser. No. 889,582

Int. Cl.[2] F24H *13/14*

U.S. Cl. 165—122 **13 Claims**



1. A heat exchange assembly for use with an air conditioning system which comprises

a heat exchange unit defining an opening for the passage of heat transfer media

a heat exchanger mounted within the unit in heat exchange relation with the heat transfer media

a cover adapted to overlay at least a portion of the opening, the cover having an end portion extending about the periphery thereof and a solid center portion, said cover further comprises generally radially extending fixed segments located intermediate said end portion and said center portion and connecting said end portion to said center portion, at least some of said segments having a louver section formed by displacing a portion of the segment from the plane of the segments, said louver section defining a slot with adjacent segments for the passage of heat transfer media therethrough: and

means juxtaposed to the cover for circulating the heat transfer media through the slots in the cover.

4,202,410

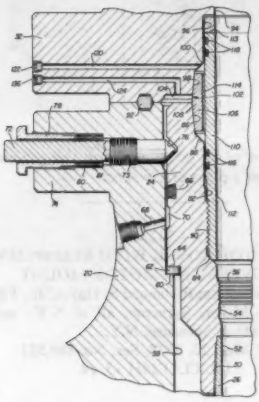
SEAL TESTING ARRANGEMENT FOR WELLHEADS

Herbert O. Quebe, Shreveport, La., assignor to W-K-M Wellhead Systems, Inc., Shreveport, La.

Filed Feb. 28, 1979, Ser. No. 15,990

Int. Cl.[2] E21B *33/03*

U.S. Cl. 166—88 **11 Claims**



9. In a wellhead assembly of the type having a tubing head, a tubing hanger supported in the tubing head, a hollow flanged member mounted on the tubing head at a location to form a joint with the tubing hanger, and a seal ring providing a seal at said joint, a seal testing arrangement comprising:

a sleeve mounted within said tubing hanger and flanged member at a location spaced inwardly of said joint between the hanger and flanged member;

means providing spaced apart seals of said sleeve with said flanged member and with said tubing hanger respectively above and below said joint to define a substantially fluid-tight chamber inwardly of said joint and adjacent thereto; and

a test passage extending in said flanged member from the exterior thereof to said chamber to direct pressurized test fluid to the chamber for the purpose of testing said seal ring for leakage from the inside of said joint.

4,202,411

ACID SOLUBLE COATING FOR WELL SCREENS

Keith W. Sharp, Sugarland, Tex., and Derry D. Sparlin, Lafayette, La., assignors to Baker International Corporation, Orange, Calif.

Filed May 24, 1978, Ser. No. 909,318

Int. Cl.[2] E21B *43/08*; B05D *7/22*

U.S. Cl. 166—244 C **9 Claims**

6. A method of coating a well liner comprising an elongate tubular member having a plurality of passageways disposed longitudinally and circumferentially of, and extending from the outer surface to the inner surface of the tubular member, said method comprising the steps of: (1) contacting said well liner with a coating amount of an impermeable inorganic matrix substantially filling said passageways and upon said inner and outer surfaces, said inorganic matrix comprising the reaction product of a first reactant consisting essentially of magnesium oxide and a second reactant consisting essentially of magnesium chloride, in a solvent therefor; and (2) drying said well liner by exposure to atmosphere.

9. A well liner comprising an elongate tubular member having a plurality of passageways disposed longitudinally and circumferentially of, and extending from the outer surface to the inner surface of, the tubular member, and an impermeable inorganic matrix coated upon said inner and outer surfaces, said inorganic matrix comprising the reaction product of a first reactant consisting essentially of magnesium oxide and a second reactant consisting essentially of magnesium chloride, in a solvent therefor.

4,202,412

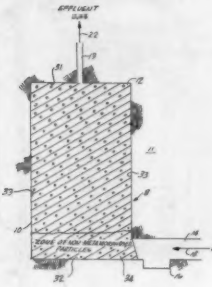
THERMALLY METAMORPHOSING OIL SHALE TO INHIBIT LEACHING

Arnold M. Ruskin, Claremont, Calif., assignor to Occidental Oil Shale, Inc., Grand Junction, Colo.

Filed Jun. 29, 1978, Ser. No. 920,237

Int. Cl.[2] E21B *43/24*; E21C *41/10*

U.S. Cl. 166—256 **33 Claims**



7. A method for recovering liquid and gaseous values from a fragmented permeable mass of particles containing oil shale in an in situ oil shale retort comprising the steps of:

establishing a processing zone having a temperature greater than 1400° F. in the fragmented permeable mass;

advancing the processing zone only part way through the fragmented mass by introducing a retort inlet mixture through a first fluid flow path to the fragmented mass on the trailing side of the processing zone and withdrawing off gas through a second fluid flow path from the fragmented mass on the advancing side of the processing zone, thereby forming water-insoluble metamorphic minerals by thermally metamorphosing particles containing oil shale;

thereafter stopping introduction of the retort inlet mixture to the fragmented mass, thereby leaving at least a portion of the fragmented mass containing non-metamorphosed particles on the advancing side of the processing zone; and

subsequently introducing sufficient heating fluid through such a fluid flow path to the fragmented mass containing non-metamorphosed particles while withdrawing effluent gas from the fragmented mass through the other such flow path for heating at least a portion of such non-metamorphosed particles to a sufficiently high temperature for forming water-insoluble metamorphic minerals at at least the surfaces of such particles.

4,202,413

WELL CEMENTING PROCESS USING PRESHEARED WATER SWELLABLE CLAYS

Joseph U. Messenger, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 15, 1978, Ser. No. 960,803

Int. Cl.[2] E21B *33/14*

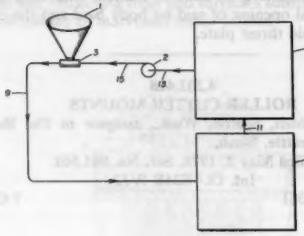
U.S. Cl. 166—292 **4 Claims**

4. A method of cementing a well comprising:

(a) forming an aqueous suspension of water swellable clay in water, said water swellable clay being present in said

water in an amount to provide a concentration of water swellable clay when mixed into a cement slurry within the range of 0.1 to 3.0 weight percent based on cement;

(b) subjecting said suspension to vigorous shearing action for at least 0.5 hour to preshear said aqueous suspension of water swellable clay;



(c) thereafter mixing said presheared aqueous suspension of water swellable clay with cement to form said cement slurry;

(d) positioning said cement slurry in said well; and

(e) maintaining said slurry in said well to allow said slurry to set.

4,202,414

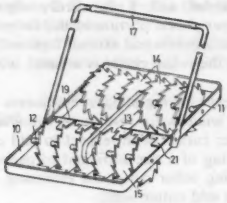
LAWN CULTIVATING MACHINE

Hans vom Braucke, Vlotho; Manfred vom Braucke, and Walter Schuring, both of Bielefeld, all of Fed. Rep. of Germany, assignors to Bielefelder Kuchenmaschinen-u. Transport-Geratefabrik vom Braucke GmbH, Fed. Rep. of Germany

Filed Mar. 20, 1978, Ser. No. 888,132

Int. Cl.[2] B62D *51/04*; A01B *45/04*

U.S. Cl. 172—42 **8 Claims**



6. In a lawn cultivating machine of the type comprising two parallel cutter shafts which are mounted on a common frame and interconnected by a transmission gear and rotatable about their axes, each of which shafts has a plurality of circular discs arranged thereon in a spaced apart relationship, the discs of one shaft being offset or displaced relative to the discs of the other shaft, and the discs of at least one shaft being structurally adapted as cutters with teeth projecting radially from the circumference of each disc of said at least one shaft, whereby the speeds of both shafts are in a certain transmission ratio and the directions of rotation of both shafts are the same, the improvement characterized by the features that all the circular discs are formed as identically fashioned cutters, the teeth of which projecting from their circumference are located relative to the radial direction at an angle whereby the teeth of the rear cutters, in the direction of operation, are inclined toward the rear at the ground, while the teeth of the front cutters in the direction of operation are forwardly inclined at the ground, wherein at least one of the two cutter shafts is provided with a scraper plate which is pivotally mounted on a shaft on the frame, between the cutter shafts and parallel thereto, and which is retained by a spring in an end position, said plate being provided with slots and the teeth of the cutters engaging in the slots of the plate.

4,202,415

SOIL CULTIVATING MACHINE

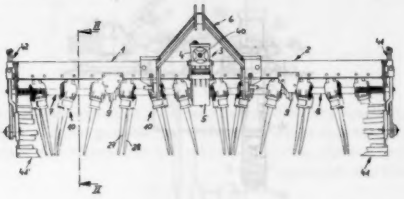
Bruno Barlage, Riesenbeck, Fed. Rep. of Germany, assignor to H. Niemeyer Söhne GmbH & Co. KG, Riesenbeck, Fed. Rep. of Germany

Filed Dec. 5, 1978, Ser. No. 966,727

Claims priority, application Fed. Rep. of Germany, Aug. 14, 1978, 2835635

Int. Cl.[2] A01B *71/00*

U.S. Cl. 172—125 **3 Claims**



1. A machine movable in a given direction of travel for cultivating the soil comprising a main beam extending substantially horizontally and transversely with respect to the direction of travel of the machine, and a tool shaft mounted parallel to spaced below the main beam, wherein the main beam and the tool shaft each comprise of two portions and a gear box mounted between the portions of the main beam and the tool shaft, and comprising an upper gear box portion and a lower gear box portion wherein the upper gear box portion includes a driving shaft extending in the direction of travel of the machine and a generally vertically driven shaft extending into the lower gear box portion, and driven by the driving shaft and wherein the lower gear box portion includes an upper, hollow, driven shaft receptive of the driven shaft of the upper gear box portion and a horizontal, hollow, driven shaft aligned transversely with the tool shaft portions and drivably receptive of the inner end portions of the tool shaft portions.

4,202,416

METHOD AND APPARATUS FOR SINKING A CASED BOREHOLE FOR PRODUCING CASED PILE FOUNDATIONS

Kurt Blaschke, Saarbrücken-Dudweiler, and Josef Roob, St. Wendel, both of Fed. Rep. of Germany, assignors to Stahl- und Apparatebau Hans Leffer GmbH, Saarbrücken-Dudweiler, Fed. Rep. of Germany

Filed Aug. 7, 1978, Ser. No. 931,723

Int. Cl.[2] E21B *3/08, 3/10*

U.S. Cl. 175—94 **5 Claims**

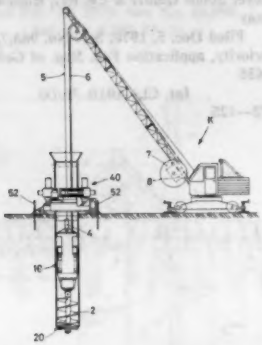
1. Apparatus for sinking a cased borehole, comprising:

(a) a crane provided with a support cable,

(b) a drilling appliance suspended from the cable to be lowered into a borehole, said drilling appliance being provided with a controllable clamping means for supporting the torque of a drive motor for a drilling tool on a drop tube, said clamping means being guided axially over a limited working stroke in a non-rotary manner on a housing supporting the drive motor, drilling tool, and power and control lines introduced into the drilling appliance from above,

(c) an auger with a preceding rotary cutter head thereon as the drilling tool being provided with a double wing-shaped bit support with diametrically located swinging wings provided with drilling bits, said wings, in a working position being swung radially outwards and limited by a stop, cutting with their bits being free of the bit support

and on reversing the direction of rotation, swinging back into their inner inoperative position, each swinging wing being provided on its radially outermost side face with a return strip inclined upwards in the drilling direction, which strips are located inside the inner diameter of the drop tube used in the inoperative position of the swinging wings, when the latter are swung inwards, and



(d) a tube extraction maching located on the ground with a hydraulically actuated clamping collar guided in parallel by at least two double-acting lifting cylinders supported on a machine frame and which can be raised and lowered, vertical guides for anchoring bolts or tubes able to be driven into the ground being provided on the machine frame or on pressure shoes located on the ground, whereby the tube extraction machine is secured in a non-rotary manner above the ground.

4,202,417

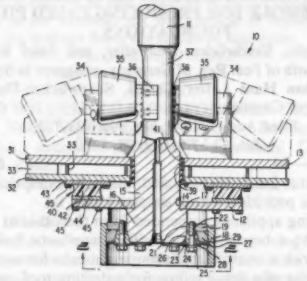
RAISE DRILL WITH ELASTOMERIC LOAD ABSORBING MEANS

George A. Alther, Midland, Tex., assignor to Smith International, Inc., Newport Beach, Calif.

Continuation of Ser. No. 833,040, Sep. 14, 1977. This application Nov. 16, 1978, Ser. No. 961,038

Int. Cl.[2] E21C *23/00*

U.S. Cl. 175—320 **4 Claims**



1. A raise drill for enlarging the diameter of a pilot hole comprising,

a drive stem having means at one end thereof for connecting to a drill string,

a bit body including a base having a plurality of rolling cutters mounted thereon, said base having a central opening for enabling the lower end of the drive stem to extend therethrough,

flexible elastomeric means interconnected between said drive stem and said bit body for absorbing the impact and dynamic loads therebetween and transferring the vertical thrust and the torque loads from the drive stem to the bit body, and

a thrust plate connected to the bottom end of said drive stem, and thrust plate being contiguous to said bit body base, and said flexible means being interconnected between said thrust plate and said bit body base, said flexible means comprising an annular element extending around the central opening of said bit body base and the central bore of said thrust plate.

4,202,418

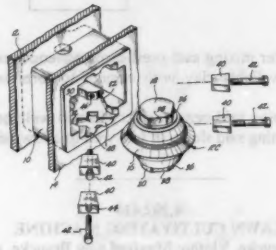
ROLLER CUTTER MOUNTS

Bruce A. Waddell, Seattle, Wash., assignor to The Robbins Company, Seattle, Wash.

Filed May 1, 1978, Ser. No. 901,561

Int. Cl.[2] E21B *9/12*

U.S. Cl. 175—361 **7 Claims**



1. In an earth boring cutterhead having rear mounted roller cutters, the mounting improvement comprising:

frame means defining a cutter well for receiving a roller cutter of a type comprising at least one rotating cutterwheel and a stator, said cutter well having a rearwardly directed portal and a forwardly directed window, wherein a peripheral portion of the cutterwheel projects through said window and extends forwardly of the cutterhead when the roller cutter is secured within said cutter well;

said frame means having integral abutments along the margins of said window for restraining forewardly movement of said roller cutters with respect to said cutter well;

said portal being of a size sufficient to permit passage of a corresponding roller cutter for mounting on and for removal from said cutter well;

said frame means also defining at least one generally forwardly directed load carrying surface; and

means for securing said roller cutter within said cutter well, comprising a load transfer block insertable from the rear of said cutter well into a load transferring position between said stator and said load carrying surface once said roller cutter has been placed within said cutter well, so that thrust loads imposed on said roller cutter during boring are transmitted from the stator to the load transfer block and from the load transfer block directly to said frame means, and means for retaining the load transfer block in place.

4,202,419

ROLLER CUTTER WITH MAJOR AND MINOR INSERT ROWS

Thomas F. Youngblood, DeSoto, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Jan. 11, 1979, Ser. No. 2,646

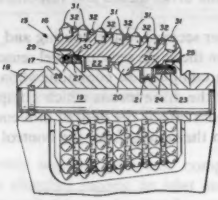
Int. Cl.[2] E21B *9/35*

U.S. Cl. 175—374 **6 Claims**

1. A multiformation earth boring apparatus, comprising:

a bit body;

a rolling cutter member rotatably mounted on said bit body, said rolling cutter member having a surface;
a multiplicity of individual major inserts;
a corresponding multiplicity of sockets for receiving said major inserts;
a multiplicity of major annular rows extending around said rolling cutter member, said major annular rows comprising said major inserts mounted in said rolling cutter member and projecting from said surface a substantial distance;
a multiplicity of individual minor inserts;



a corresponding multiplicity of sockets for receiving said minor inserts; and
a minor annular row extending around said rolling cutter member, said minor annular row comprising said minor inserts mounted in said rolling cutter member and projecting from said surface a lesser distance than said substantial distance that said major inserts project from said surface, said minor annular row of minor inserts located between said major annular rows of major inserts.

4,202,420

ROCK DRILL WITH HARD METAL DRILLING HEAD

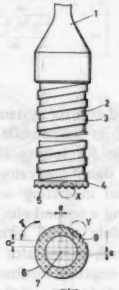
Wolfgang Peetz, Blitzenreute; Siegfried Klaissle, Unterankenreute, and Bernhard Moser, Altshausen, all of Fed. Rep. of Germany, assignors to Hawera Probst GmbH & Co., Ravensburg, Fed. Rep. of Germany

Filed Jul. 31, 1978, Ser. No. 929,269

Claims priority, application Fed. Rep. of Germany, Aug. 5, 1977, 2735368

Int. Cl.[2] E21C *13/08*

U.S. Cl. 175—395 **20 Claims**



1. A rock drill for rotary blow drilling which includes: a chucking shank, a drill shank, a drilling head at least partly consisting of hard metal, one end of said drill shank being connected to said chucking shank while the other end of said drill shank has connected thereto said drilling head, said drilling head consisting of a solid formed piece having the outer end face thereof provided with pyramidal cutting bodies forming a single integral piece with said formed piece and tapering with increasing distance from said drill shank, the base surfaces of said pyramidal cutting bodies being diamond-shaped and having a corner angle of about 45°.

4,202,421

IMPACT BIT HAVING CIRCUMFERENTIAL INSERTS OF DIFFERING COMBINATION

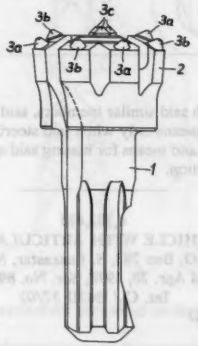
Klaus Pinck, Feucht, Fed. Rep. of Germany, assignor to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany

Filed Oct. 17, 1978, Ser. No. 952,052

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1977, 2749613

Int. Cl.[2] E21C *13/06*

U.S. Cl. 175—410 **3 Claims**



1. A hammer drill bit including an axis, a shaft and a crown having an outer periphery; a plurality of hard metal circumferential studs carried by the crown and distributed along said periphery essentially on a single circle; each circumferential stud having an axis inclined at an acute angle with respect to the bit axis and a conical cutting tip oriented obliquely away from the bit axis; the improvement wherein the acute angles of the axes of said circumferential studs viewed consecutively along said circle alternate between a relatively large magnitude and a relatively small magnitude differing by 10° to 25° from one another.

4,202,422

SAFETY LOCK FOR AGRICULTURAL WINDROWER OR THE LIKE

Kenneth W. McLean, New Holland, Pa., assignor to Sperry Rand Corporation, New Holland, Pa.

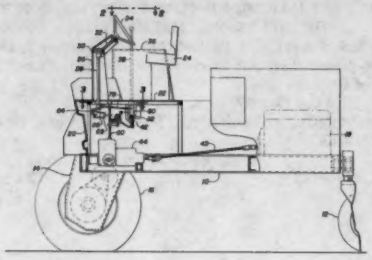
Filed Aug. 23, 1978, Ser. No. 936,161

Int. Cl.[2] B62D *11/02*; B60R *21/14*

U.S. Cl. 180—6.48 **8 Claims**

1. In a self-propelled harvesting machine adapted to cut and arrange forage crops in swaths or windrows comprising a mobile frame, having a pair of drive wheels at opposite sides, an engine connected to a pair of hydrostatic units respectively connected to said drive wheels, a steering wheel on a rotatable shaft for manual manipulation in opposite directions from a neutral position, linkage means connected between said shaft and hydrostatic units and operable when rotated to vary the relative speeds of said drive wheels and thereby steer the machine in desired directions, and a speed control lever movably mounted about one axis for manual manipulation in opposite forward speed and reverse speed directions from a neutral position and interconnected to said linkage means for equally varying the speed and direction of rotation of said drive wheels, said lever also being movable about another axis transverse to said one axis only when in said neutral position; the improvement comprising safety means including similar members respectively movable with said linkage means simulta-

neously, locking members, means responsive to movement of said speed control lever in one direction about said another axis to project said locking members respectively into locking



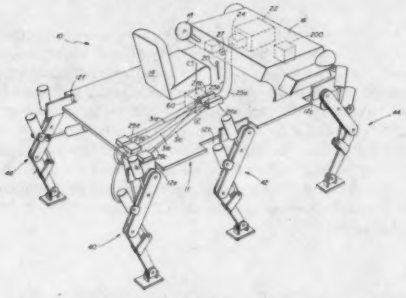
engagement with said similar members, said engagement locking said linkage means only when said steering wheel is in said neutral position, and means for biasing said speed control lever in said one direction.

4,202,423

LAND VEHICLE WITH ARTICULATED LEGS

Jose M. Soto, P.O. Box 783, S. Lancaster, Mass. 01561

Filed Apr. 20, 1978, Ser. No. 898,457
Int. Cl.[2] B62D *57/02*
U.S. Cl. 180—8 D **24 Claims**



1. A vehicle particularly for movement over a non-uniform surface which comprises:

(a) a housing through which a longitudinal axis Y, a transverse axis X and a vertical axis Z pass the axes being mutually perpendicular, one to the other, the horizontal plane of the vehicle being parallel with the X and Y axes when the vehicle is balanced;

(b) a plurality of articulated legs secured to and extending downwardly from said housing, each of the legs comprising at least two links, an upper link and a lower link,

the upper link pivotally joined to the housing at one end and pivotally joined at its other end to the upper end of the lower link, the longitudinal axes of the links intersecting and defining an angle,

drive means secured to the legs to effect movement of the links through angle A and movement of the upper link through angles B and C; one side of the angle B coincident with the longitudinal axis of the upper link and the other side parallel to the X axis, one side of the angle C coincident with the longitudinal axis of upper link the other side parallel to the Y axis, the movement through the angles B and C resulting in a substantially cone-shaped region, the apex of the cone being at the one end of the upper link;

(c) angle sensors to monitor the angles of each of the legs and to provide outputs corresponding to the same;

(d) a level sensor to monitor the horizontal plane of the vehicle in reference to the X and Y axes and to provide outputs corresponding to the position of the housing in relation to the X and Y axes;

(e) control means secured to the vehicle to effect forward, rearward, sideward and rotary motion of the vehicle, said control means providing signals which result in the movement of the legs;

(f) a power source secured to the housing and in communication with the drive means and responsive to a computer; and,

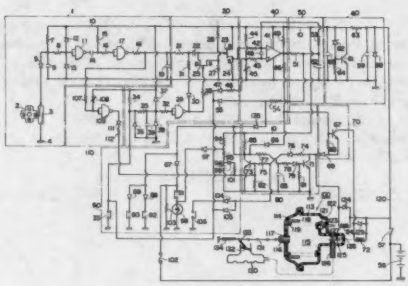
(g) a computer secured to the housing and responsive to the signals from the angle sensors, level sensor and the control means, the computer in communication with the power source and the drive means which computer through the control means effects the desired movement of the legs in response to the signals from the control means and level sensor.

4,202,424

AUTOMOBILE SPEED CONTROL SYSTEM

Naoji Sakakibara, Chiryu, and Shoji Kawata, Okazaki, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Mar. 24, 1978, Ser. No. 889,692
Claims priority, application Japan, Mar. 24, 1977, 52-32498
Int. Cl.[2] B05K *31/00*
U.S. Cl. 180—176 **6 Claims**



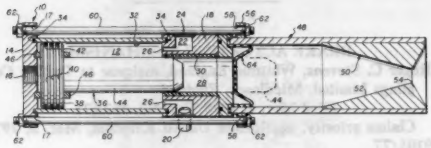
1. Automobile speed control system for automatically controlling the speed of an automobile and comprising speed control selector means for setting and cancelling a desired speed, an actual speed signal generator circuit which generates a first electrical signal indicating actual automobile speed, circuit means providing a second electrical signal which indicates desired automobile speed, circuit means providing a negative feedback signal, comparator circuit mean combining said first, second and negative feedback signals to provide an error signal, and a means to convert the error signal to provide an error signal, and a means to convert the error signal to mechanical movement of a throttle valve, characterized in that the circuit means providing the negative feedback signal comprises delay circuit means for receiving the error signal from the comparator circuit means and supplying the delayed error signal as the negative feedback signal to the comparator circuit means, and in that said speed selecting control means comprises switch means for resetting the level of the feedback signal to a level corresponding to the released, closed position of the throttle valve upon setting or cancelling a desired speed.

4,202,425

ACOUSTIC IMPULSE GENERATOR

William H. Hambrick, Sr., P.O. Box 1628, Conroe, Tex. 77301, and Charles L. Raybon, 5836 W. Flower St., Phoenix, Ariz. 85033

Filed Mar. 14, 1978, Ser. No. 886,440
Int. Cl.[2] G01V *1/38*
U.S. Cl. 181—120 14 Claims



1. An acoustic impulse generator comprising a housing forming a gas chamber having an inlet end with a passage communicating with the gas chamber for receiving a charge of gas and an outlet end with a passage communicating with the gas chamber for exhausting gas therefrom,

a passageway in said generator,

a piston means slidably disposed for reciprocal movement within said passageway,

a firing chamber attached to said gas chamber adjacent the exit of said passageway thereof and being characterized by an outlet orifice in communication with a liquid environment, and,

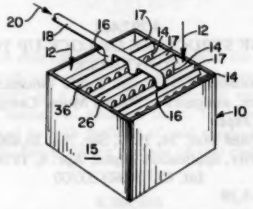
a diaphragm means affixed to said generator proximate said passageway so that said piston means travels through said passageway into direct contact with the said diaphragm means and thereafter into said firing chamber thereby expelling liquid through the orifice and producing an acoustic impulse.

4,202,426

EXHAUST GAS SPLITTER CONSTRUCTION

Fred V. H. Judd, 4876 Victor St., Jacksonville, Fla. 32207

Filed Dec. 5, 1978, Ser. No. 966,577
Int. Cl.[2] F01N *1/24*
U.S. Cl. 181—257 11 Claims



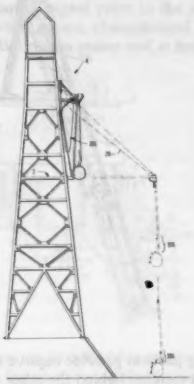
1. In a sound absorbing device for noisy exhaust gas flow having dust particles suspended therein, and having sound absorbing fiber mounted exposed to said exhaust gas flow for large area surface contact of said fiber with the exhaust gas flow, the improvement comprising means for flowing relatively dust-free gas as a boundary layer of said gas adjacent to said exposed fiber surfaces inhibiting dust deposition from said exhaust gas upon and between the fibers to maintain the sound absorbing efficiency of said fiber.

4,202,427

DERRICK ESCAPE SYSTEM

Charles A. Sada, Garden Grove, Calif., and William F. McKamie, Missouri City, Tex., assignors to Santa Fe International Corporation, Orange, Calif.

Filed May 22, 1978, Ser. No. 908,547
Int. Cl.[2] A62B *1/02*
U.S. Cl. 182—2 101 Claims



1. An escape system for personnel on the derrick of a drilling rig comprising:

(a) a structural member pivotally secured to a portion of said drilling rig;

(b) a personnel carrier being secured to said structural member for supporting the personnel thereon, the personnel carrier having access means for allowing personnel to move from the drilling rig onto the personnel carrier;

(c) said structural member being releasably secured adjacent to said drilling rig;

(d) release means integrated with said structural member and said drilling rig for releasing said structure member from said drilling rig; and

(e) means for allowing said structural member with said personnel carrier to pivot away from said drilling rig displacing said personnel carrier with personnel thereon a sufficient distance from said drilling rig to avoid injury of the personnel.

4,202,428

LADDER

Ronald P. Hickman, Waltham Abbey, England, assignor to Inventec International Limited, Guernsey, Channel Islands

Continuation of Ser. No. 719,957, Sep. 2, 1976, which is a division of Ser. No. 558,120, Mar. 13, 1975. This application Aug. 31, 1977, Ser. No. 829,445
Claims priority, application United Kingdom, Mar. 14, 1974, 11457/74; Apr. 11, 1974, 16263/74
Int. Cl.[2] E06C *1/383*
U.S. Cl. 182—22 33 Claims

1. A foldable and extendable ladder having at least two ladder sections, each section comprising:

a central elongate support member and two outer elongate members arranged one on each side of, and substantially parallel to, the central member; a series of rungs disposed at spaced intervals on each side of the central member and foldably connected to the central member and one of the outer members, each rung being arranged to fold between an operative position, in which it extends generally at right angles to the longitudinal direction of each member to which it is connected, and a storage position in which the rung lies substantially parallel to the central member with the outer member to which it is connected extending

parallel to and in close juxtaposition with the central member;

wherein the ladder sections each have a front face and a rear face and are adapted to be moved relatively to one another between an aligned position one behind the other and a number of extended, partially overlapping parallel positions, the central support members having slidably

cooperating parts to provide captive location of one central support member behind the other during their relative movement,

whereby the rungs of each ladder section are capable of being in either the operative or storage positions in the relatively aligned and extended positions of the central support members.

4,202,429

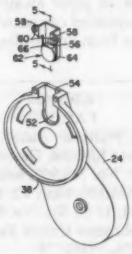
MOUNTING FOR A STATIONARY PAD OF A DISC BRAKE STRUCTURE

James P. Lob, Oconomowoc, Wis., assignor to Deere & Company, Moline, Ill.

Filed Jun. 12, 1978, Ser. No. 914,563

Int. Cl.[2] F16D 65/02

U.S. Cl. 188—71.1 **6 Claims**



1. In a drive train including a chain case, a drive shaft extending into the chain case and having a brake disc mounted thereon for rotation therewith adjacent the chain case, a stationary brake puck located in a recessed pocket defined by the chain case and opening toward the brake disc for selected engagement therewith and a puck housing releasably secured for the chain case and carrying an actuating means and a shiftable brake puck located for selected engagement with the brake disc at a location aligned with and on the opposite side of the brake disc from that adapted for engagement by the stationary brake puck, the improvement residing in an improved mounting for the stationary brake puck comprising: said pocket having an entrance located in an outer peripheral location of the chain case; a puck carrier received in and removable from the pocket radially relative to said disc through said entrance and having an end located at said entrance; said stationary brake puck being received in an end of the carrier remote from said peripheral location; and fastening means releasably holding the puck carrier in said pocket and the puck housing in place on said case, whereby the carrier and the housing may be simultaneously released from said case by removal of said fastening means when replacement of the one or the other or both of the stationary and shiftable brake pucks is desired.

4,202,430

BRAKE ACTUATING MECHANISMS

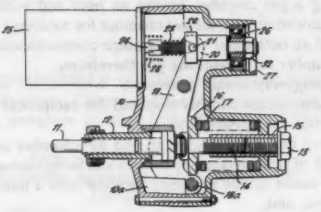
Roger C. Stevens, Whitton, England, assignor to Twiflex Couplings Limited, Middlesex, England

Filed Mar. 2, 1978, Ser. No. 882,671

Claims priority, application United Kingdom, Mar. 3, 1977, 9101/77

Int. Cl.[2] F16D 65/34

U.S. Cl. 188—171 **7 Claims**



1. A brake actuating mechanism comprising a drive motor, a linearly movable brake applying member, spring means to force the member in a brake actuating direction to apply the brake, a lead screw driveably connected to the motor, a nut having a ball screw located on the lead screw to provide a rotary to linear/linear to rotary drive connection, means to connect the nut to the brake applying member, means for connecting a source of electric power to the motor to turn the motor in one direction and thereby draw the nut along the lead screw to move the brake applying member in a brake releasing direction, means for connecting a further electric power source to the motor to lock the motor electrically against rotation and means to switch the motor from the first power source to the further power source when the brake applying member has moved to a brake released position.

4,202,431

PASSAGE STRUCTURE OF LOCK-UP TORQUE CONVERTER

Takahiro Yamamori, Tokyo, and Kunio Ohtsuka, Yokohama, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Mar. 14, 1979, Ser. No. 20,400

Claims priority, application Japan, Apr. 4, 1978, 53-38852

Int. Cl.[2] F16D 33/00

U.S. Cl. 192—3.29 **8 Claims**

1. In a lock-up torque converter

an input member;

a converter cover driven by said input member;

a pump impeller secured to said converter cover and forming therewith a chamber;

an output shaft;

a turbine runner within said chamber connected to said output shaft;

a clutch piston mounted within said chamber;

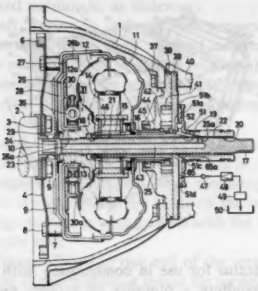
a stationary sleeve rotatably receiving said output shaft and forming therewith an annular space;

a pump;

a pump cover for said pump radially extending from said stationary sleeve;

a pump driving sleeve secured to said pump impeller and operatively connected to said pump to drive the latter, said pump drive sleeve surrounding a portion of said stationary sleeve and forming therewith a passage communicating with the inside of said pump impeller;

a control valve;



said output shaft having an axial passage and a radial passage communicating with said axial passage;

a spacer mounted within said annular space to divide the latter into a first annular chamber communicating with the inside of said turbine runner and into a second annular chamber communicating with said radial passage of said output shaft and with said control valve.

4,202,432

CLUTCH DISK FOR USE IN AUTOMOBILE

Fukutaro Komori, Tokyo, Japan, assignor to Komori Seisakusho Co., Ltd., Tokyo, Japan

Filed Dec. 12, 1977, Ser. No. 859,479

Int. Cl.² F16D *69/02*

U.S. Cl. 192—107 M **17 Claims**

1. In a clutch disk for use in an automobile, the improvement wherein a plurality of supporting plates are separately fastened to the periphery of a plate, and masses of organic friction material and masses of sintered metal friction material are alternately fixed to both surfaces of said supporting plates for forming the frictional sliding surface of said clutch disk.

4,202,433

TOOL PROTECTION ARRANGEMENT FOR HYDRAULIC PRESSES

Horst Baltschun, Rülzheim, Fed. Rep. of Germany, assignor to SMG Süddeutsche Maschinenbau-Gesellschaft mbH, Fed. Rep. of Germany

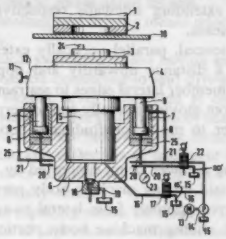
Filed Mar. 21, 1978, Ser. No. 888,749

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1977, 2712472

Int. Cl.² B26D *7/24*

U.S. Cl. 192—129 A **10 Claims**

2. An arrangement for protecting a set of tools in a hydraulic press against an overloading by an object present in a tool space of the hydraulic press, the arrangement comprising a displacement switch means for monitoring at least a portion of a path of movement of a press ram in a working stroke direction and for providing an output signal indicative of a predetermined press ram movement, a control means for providing an output signal during a movement of the press ram, and a control circuit for evaluating a sequence of the output signals of the displacement switch means and the control means in such a manner that a false signal is generated when the control means provides an output signal prior to the output signal of the displacement switch means, characterized in that at least one fast stroke cylinder piston means and at least one working



stroke pressure means are provided for causing a displacement of the press ram in the working stroke direction, the control means is arranged in a path of force of at least one component of the hydraulic press, the control means includes a signal transducer operating virtually stationarily as a function of pressure, the hydraulic press includes a lower frame member at which is arranged the at least one fast stroke cylinder piston means, the fast stroke cylinder piston means constituting the at least one component of the hydraulic press, and in that the signal transducer is arranged between a cylinder of the fast stroke cylinder piston means and a portion of the lower frame member of the hydraulic press.

4,202,434

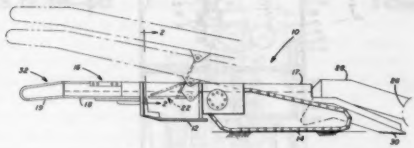
STABILIZER ASSEMBLY FOR A MINING MACHINE CONVEYOR

Charles R. Herron, Russell, Ky., assignor to National Mine Service Company, Pittsburgh, Pa.

Continuation of Ser. No. 782,181, Mar. 28, 1977, abandoned. This application Dec. 11, 1978, Ser. No. 968,016

Int. Cl.² B65G *21/00*

U.S. Cl. 198—316 **10 Claims**



1. A conveyor stabilizer for an underground mining machine comprising,

a mining machine body portion,

a conveyor assembly having a forward end portion and a rearward end portion,

said conveyor assembly extending longitudinally above said mining machine body portion with said forward end portion being pivotally connected to said mining machine body portion,

a stabilizing member positioned between said conveyor assembly and said body portion, said stabilizing member having a first end portion and a second end portion,

pivot means for pivotally connecting said first end portion of said stabilizing member to said conveyor assembly,

restraining means to restrain lateral movement of said stabilizing member,

said restraining means including a body portion positioned longitudinally on said mining machine body portion and extending in underlying relation with said conveyor assembly,

said restraining means body portion having a pair of spaced, parallel vertically extending sidewalls,

said stabilizing member second end portion being adapted for longitudinal movement on said restraining means,

said stabilizing member having lateral edges positioned between and closely adjacent to said pair of spaced, parallel vertically extending sidewalls respectively of said restraining means,

said pair of spaced, parallel vertically extending sidewalls extending a distance upwardly and oppositely of said stabilizing member lateral edges to restrain said stabilizing member from moving laterally and to permit said stabilizing member to move longitudinally between said sidewalls, and

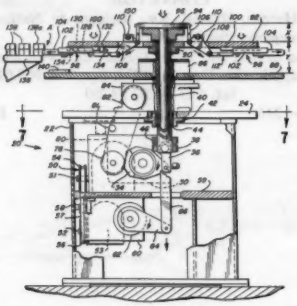
said stabilizing member being supported by said restraining means on said mining machine body portion to restrain said conveyor assembly from lateral swaying movement above said mining machine body portion and thereby rigidify said conveyor assembly.

4,202,435

AUTOMATIC RECIPROCATING, INDEXING AND PICKING ASSEMBLY APPARATUS

Josef Mang, Palos Hills, and Robert W. Waters, Waukegan, both of Ill., assignors to Emerson Electric Co., Chicago, Ill.

Filed Aug. 30, 1978, Ser. No. 938,085
Int. Cl.[2] B23Q 7/02
U.S. Cl. 198—339 **6 Claims**



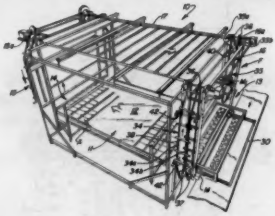
4. In a motor-driven, automatic, reciprocating, indexing, and picking assembly device of the type wherein vertically reciprocating plates driven by cam-actuated oscillator means effect both the vertical displacement and the horizontal extension and retraction of associated parts pick-up units, the improvement comprising: a motor driven first reducer means characterized as driving a first oscillator means, a second reducer means operable to drive a second oscillator means, and an adjustable positive drive means drivably connecting said first and second reducer means, whereby adjustment of said positive drive means effects substantial synchronization of the outputs of the said first and second oscillator devices.

4,202,436

APPARATUS FOR HANDLING A PLURALITY OF ARTICLES

Paul J. Kristapovich, and Ronald M. Schiltz, both of Lake Mills, Wis., assignors to Crepaco, Inc., Lake Mills, Wis.

Filed Feb. 5, 1979, Ser. No. 9,356
Int. Cl.[2] B65G 37/00
U.S. Cl. 198—472 **16 Claims**



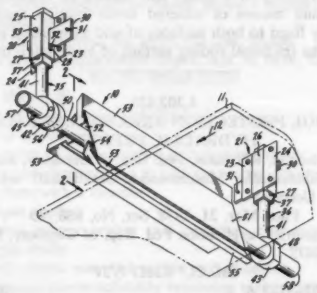
1. An apparatus for use in combination with a supporting surface for handling a plurality of articles segregated into groups, each group having the articles thereof arranged in a predetermined pattern, said apparatus comprising a framework having an infeed section and a discharge section, said sections being adapted to be disposed respectively adjacent spaced first and second peripheral segments of the surface; a plurality of frame elements movably carried on said framework; first means movably mounted on said framework for successively positioning groups of articles at a station provided on said infeed section; second means movably mounted on said framework and operable in timed sequence with said first means for positioning a frame element in substantially encompassing relation with a group of articles disposed at said station; third means movably mounted on said framework and operable in timed sequence with said second means for simultaneously moving a group of articles and encompassing frame element from said station, across said surface and to said discharge section; fourth means mounted on said framework for effecting separation at said discharge section of a group of articles from an encompassing frame element; and fifth means movably mounted on said framework and coacting with said second means for returning a separated frame element to said station and encompassing another group of articles.

4,202,437

SCRAPER ASSEMBLY FOR A CONVEYOR BELT

James R. Gordon, 301 W. Boling St., Benton, Ill. 62812

Continuation of Ser. No. 840,107, Oct. 6, 1977, abandoned. This application Mar. 22, 1979, Ser. No. 22,923
Int. Cl.[2] B65G 45/00
U.S. Cl. 198—497 **15 Claims**



1. A scraper assembly for a conveyor belt comprising:

a pair of slide housings mounted adjacent opposite sides of the conveyor belt, each slide housing having a slideway, the two slideways being aligned parallel to each other in a plane transverse to the plane of the conveyor belt;

a pair of support slides, each slidably mounted in one of the slideways, each support slide including a shaft support collar;

releasable slide mounting means for securing each support slide in fixed position in its slideway;

a scraper shaft, having its opposite ends projecting through and supported by the shaft support collars, extending across the conveyor belt in spaced relation thereto;

a scraper core, affixed to the scraper shaft, extending across the conveyor belt, and including a longitudinal blade-mounting channel;

a scraper blade, having a scraper edge surface and a mounting element, the mounting element fitting in sliding interlocking engagement into the blade-mounting channel in the scraper core to mount the blade on the core with the scraper edge surface in engagement with the full width of the conveyor belt;

an annular flange affixed to one end of the scraper shaft;

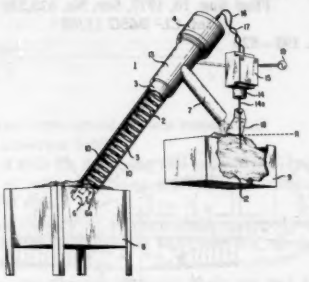
and adjustable flange mounting means for securing the annular flange to one of the shaft support collars to maintain the shaft in fixed axial position and in one of a plurality of fixed angular orientations, adjustment of the angular orientation of the shaft being effective to compensate for a substantial range of wear on the scraper edge surface of the blade.

4,202,438

FLEXIBLE CONVEYOR SYSTEM

James V. Rotilio, 329 Hackensack St., Carlstadt, N.J. 07072

Filed Jul. 25, 1977, Ser. No. 818,445
Int. Cl.² B65G *43/08, 33/26*
U.S. Cl. 198—524 **4 Claims**



2. The subcombination comprising a portable flight constructed and arranged for use with a conveyor system comprising a rotatable helical spring for moving granular, pulverized or fluid material from a first position to a second position,

said portable flight comprising at least one semicircular disk, and

means for securing said portable flight in fixed relation between adjacent coils of said helical spring,

wherein said last-named means comprises said portable flight constructed from a pair of parallel semicircular disks connected together at their external peripheries by a semicircular wall, forming between them a shallow semicircular cup which fits over one of the rungs of said spring, and means for bolting said cup to said rung.

3. A conveyor system for moving granular, pulverized or fluid material from a first position to a second position, which comprises in combination:

an elongated flexible tube including means for receiving said material at one of said positions and means for expelling said material at or near the other said position,

a flexible helical spring enclosed in said tube and extending coaxially along the length of said tube,

means for driving said helical coil to rotate about its longitudinal axis relative to the inner surface of said tube,

said flexible helical spring including a plurality of portable flights including substantially plane members inserted between adjacent coils of said helical spring at spaced-apart positions along the length thereof, for continuously picking up said material at said receiving means and delivering said material to said expelling means when said spring is driven to rotate about its axis,

means for controlling said driving means which comprises in combination:

electromechanical switching means having an "on" position and "off" position connected to said driving means,

an elongated flexible lever connected at one end to said switching means whereby deflection of said flexible lever in one direction moves said switching means from "on" to "off" position, and deflection of said lever in the opposite direction moves said lever from "off" to "on" position,

means mechanically coupled to said lever and disposed adjacent said expelling means for contact with and deflection by a pile of said material collected out of said expelling means for deflecting said lever at a preselected level of said collected material, whereby to turn said switching means to "off" position when said material is above said preselected level, and turn said switching means to "on" position when said material is below said preselected level,

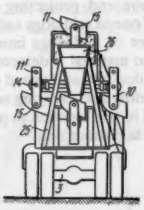
wherein said means mechanically coupled to said lever comprises a deflecting ring disposed in a plane substantially transverse to the principal vertical axis of said pile of material, said plane being substantially tangential to said pile of material at a preselected level of said pile whereby at least a portion of said ring is contacted and deflected by said pile at said preselected level.

4,202,439

THROWER OF TRANSPORTED MATERIALS

Bronislav M. Klimkovsky, ulitsa Universitetskaya, 2, korpus 1, kv. 12; Boris A. Azikov, ulitsa Poligonnaya, 22, kv. 68, both of Dnepropetrovsk; Mikhail U. Zemtsov, Delegatskaya ulitsa 9, kv. 110, Moscow; Sergei A. Kusch, prospekt Ilicha, 17, kv. 27, and Nikolai P. Nalivkin, prospekt Ilicha, 17, kv. 21, both of Dnepropetrovsk, all of U.S.S.R.

Filed Jul. 12, 1978, Ser. No. 924,087
Int. Cl.² B65G *31/04*
U.S. Cl. 198—642 **3 Claims**



1. A thrower of transported materials, comprising: a rotatable rotor; at least one container adapted to receive and unload the said material, pivotally connected with said rotor; at least one intermediate connecting rod pivotally interconnecting said rotor and said container respectively, the axes of the rotation of said rotor and of the pivots of said connecting rod being parallel, the distance between the said axes of the rotation of the pivots of said connecting rod equalling one half of the distance between the axis of the rotation of said rotor and the axis of the rotation of the pivot of said connecting rod; a drive

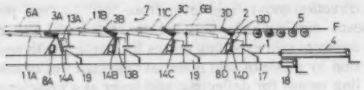
for rotating in the same direction said rotor and said connecting rod at a relative angular speed and for rotating said container at a speed which is twice the speed of the rotation of said rotor.

4,202,440

APPARATUS FOR ACCUMULATING MATERIALS ON A SHUTTLE CONVEYOR

Akira Niki, Kariya, Japan, assignor to Nagoya Kiko Kabushiki Kaisha, Japan

Filed Apr. 28, 1978, Ser. No. 900,915
Int. Cl.[2] B65G *25/00*
U.S. Cl. 198—718 **6 Claims**



1. An apparatus for accumulating materials on a shuttle conveyer having a plurality of rollers defining a carrying surface on which said materials are conveyed, said apparatus comprising:

a moving body supported on shuttle conveyer frame; cylinder means for reciprocating said moving body along a path of travel of said materials;

a plurality of dogs provided on said moving body and spaced apart from one another along said path of travel at a distance corresponding to the distance of each intermittent travel of said materials, said dogs being each vertically rotatable between a lowered position and a raised position in which each said dog projects above said carrying surface to engage one of said materials upon forward movement of said moving body;

a plurality of means provided on said moving body for magnetically maintaining said dogs in said raised position, but allowing said dogs to rotate into said lowered position upon contact with said materials during backward movement of said moving body; and

a plurality of means vertically rotatably supported on said frame for detecting any of said materials in a particular location on said carrying surface, each of said detecting means having one end projecting above said carrying surface ahead of one of said dogs and another end engageable with another of said dogs immediately behind said one dog when no material is detected by said one end to move said other dog into said raised position, said one end being lowered below said carrying surface upon arrival of any said material in said location to prevent said other end from contacting said other dog.

4,202,441

MODULAR COMPARTMENTALIZED CONVEYOR BELT SYSTEM

Ronald D. Bourgeois, 38 Ellison Park, Waltham, Mass. 02154

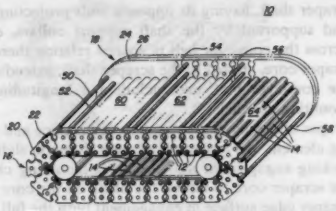
Filed Oct. 3, 1978, Ser. No. 948,153
Int. Cl.[2] B65G *17/00, 17/24*
U.S. Cl. 198—779 **3 Claims**

1. A modular compartmentalized conveyor belt system comprising:

a plurality of spaced roller bearing pin.

a plurality of rollers mounted on said pins;

first and second spaced sets of raised link members, each said set arranged in first and second rows for coupling adjacent pairs of said pins, said link members in each row disposed in close overlapping relationship with those in the other row; each of said link members including two horizontally spaced holes for receiving adjacent pins and at least one



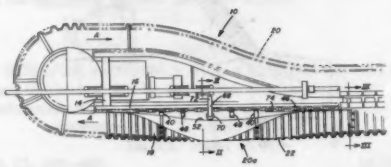
hole vertically spaced from said horizontally spaced holes for receiving a flight pin; each of said links in each of said rows meeting with adjacent link members in its row approximately midway of a link member in the other row and each of said link members having at each edge a flight pin recess which cooperates with that of an adjacent link member in the same row for accommodating a flight pin received in a vertical spaced hole in a link member of the other row.

4,202,442

CONVEYOR

Joseph S. David, Franklin, Pa., assignor to Joy Manufacturing Company, Pittsburgh, Pa.

Filed Aug. 10, 1977, Ser. No. 823,320
Int. Cl.[2] B65G *15/08*
U.S. Cl. 198—820 **9 Claims**



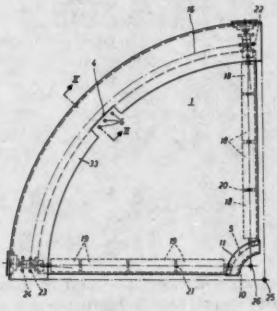
1. In a conveying apparatus wherein an elongated endles conveying element includes an endless flexible pan and a plurality of bracket means spaced longitudinally of the pan and supported by an endless guide means for support of the pan for orbital travel with respect to the guide means within an endless path including an elongated discharge path portion wherein a discharge means cooperates with the conveying element to move the pan to a material discharge orientation displaced from a material containing orientation thereof, and wherein an elongated flexible drive element is coextensive with at least the discharge path portion and is cooperable with the conveying element and with a motive means to drive the conveying element in its traverse of the discharge path portion and further wherein said bracket means provide a driving connection between said drive element and said pan for such driving of said conveying element and said bracket means include means

continuously cooperable with said guide means and said pan for maintaining support of said conveying element with respect to said guide means throughout such orbital travel while permitting such pan to assume such material discharge orientation during its traverse of the discharge path portion the improvement comprising: other support means, than the first mentioned said bracket means spaced longitudinally along said drive means and intermediate said first bracket means; said other support means being engageable with said flexible drive element and said conveying element for support of said pan only when said pan is in such material containing orientation.

4,202,443
CONVEYOR BELT CURVE

Werner Bührer, Thalwil, Switzerland, assignor to Transver AG, Wadenswil, Switzerland

Filed Nov. 8, 1978, Ser. No. 958,728
Claims priority, application Switzerland, Nov. 22, 1977, 14273/77
Int. Cl.[2] B65G *15/02, 21/16*
U.S. Cl. 198—831 7 Claims



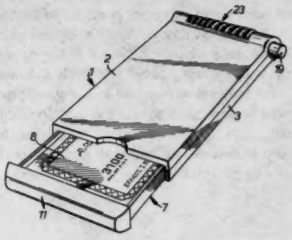
1. A conveyor belt-curved portion comprising:
an endless conveyor belt;
two rows of rolls for deflecting said endless conveyor belt;
each row of rolls comprising a plurality of substantially cylindrical rolls;
drive means embodying a driven chain equipped with entrainment members fixed at the chain for driving said conveyor belt;
said driven chain having an upper chain run and a lower chain run;
guide rails for guiding the upper and lower chain runs of the chain therein;
said guide rails determining the curvature of the curved portion of the conveyor belt; and
said entrainment members containing rolls rollingly supported at the guide rails;
the chain comprises a multiplicity of chain links disposed in spaced relationship from one another;
each of the chain links having a shaft upon which there is seated a respective roll of the entrainment members, in order to bear by means of its outer surface at one of the guide rails;
a respective elastomeric tension spring provided for each roll of each entrainment member;
said tension spring having opposed ends;
one end of the tension spring bearing at the shaft carrying the related roll and the other end at the conveyor belt.

4,202,444
Patent Not Issued For This Number

4,202,445
SECURITY WALLET OR CONTAINER

Charles B. A. Porter, Sheristone, 4 Priory Way, Tetbury, Gloucestershire, England

Filed Oct. 31, 1978, Ser. No. 957,004
Int. Cl.[2] A45C *11/00;* E05G *3/00;* G08B *19/00*
U.S. Cl. 206—37 10 Claims

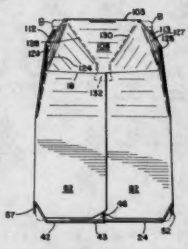


1. A security wallet or container suitable for carrying credit cards and comprising a hollow body, a receptacle for the cards in the form of a drawer slidably received in the body, a latch mechanism including a latch member operative to latch the drawer in the closed position, a locking mechanism operative to lock the wallet or container with the drawer in the latched position, and a defacing mechanism operative to deface the contained cards in the event of forcible opening of the wallet or container when latched without following the normal unlocking procedure, the latch member being associated with the defacing mechanism in such manner that movement of the latch member with the drawer in the event of the latter being forcibly opened while latched serves to actuate the defacing mechanism.

4,202,446
BOTTLE PACKAGE

Robert L. Sutherland, Campbell Hall, N.Y., assignor to Federal Paper Board Company, Inc., Montvale, N.J.

Filed Nov. 13, 1978, Ser. No. 959,489
Int. Cl.[2] B65D *65/12, 65/22*
U.S. Cl. 206—147 4 Claims



1. A carrier package comprising an assembly of articles, in the form of bottles, arranged in a double row and in trans-

versely aligned pairs, enclosed in a tubular carton formed from a single blank of paperboard or similar foldable sheet material, said carton having a top wall panel, integrally hinged sidewall forming panels depending from side edges of said top wall panel and extending along the oppositely disposed outer side faces of the article assembly, bottom wall forming panels integrally hinged to the bottom edges of said sidewall panels and extending inwardly toward each other with overlapped margins, which margins of said bottom wall forming panels have interengaging cooperating means securing the panels together and forming a tightly wrapped package, end wall forming panels integrally hinged to the ends of said sidewall panels and disposed in end closing relation at opposite ends of the tubular carton, the uppermost portions of said end wall panels being slanted inwardly of the articles and being connected to the sidewall panels by inwardly folded triangular web formations which lie on the inner faces of upper portions of said sidewall panels, said end wall panels having inner marginal portions in overlapping relation, locking panels hinged to the opposite end edges of said top wall forming panel and folded downwardly therefrom into overlying relation with top marginal portions of said end wall panels, and latch means on said locking panels which are interengaged with cooperating means on the overlapping marginal portions of said end wall panels securing said panels in end closing position

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4,202,447

COLLATING AND BUNDLING BELT LOOPS

Louis W. Breck, Jr., El Paso, Tex., assignor to Billy The Kid Inc., El Paso, Tex.

Continuation of Ser. No. 741,044, Nov. 11, 1976, abandoned. This application Dec. 7, 1977, Ser. No. 858,095

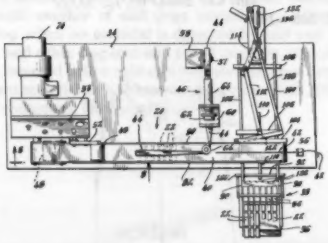
Int. Cl.[2] B65D *85/67*

U.S. Cl. 206—389 **5 Claims**

1. As an article of manufacture, a bundle of collated belt loops comprising:

a core,

a plurality of groups of separated, substantially rectangular, flat and coplanar fabric belt loops each belt loop in any



one of said groups being of similar color and shading as any other belt loop in the same group, and at least one of said belt groups being of a different shade or color than another one of said groups, and

means wound about said core for holding each group of belt loops to said core and maintaining them in spaced relation in the order collated, whereby the means can be unwound to present the belt loop groups in order.

4,202,448

EQUIPMENT FOR TRANSPORTING AND/OR STORING TEXTILE BOBBINS

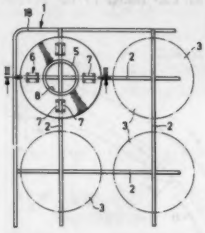
Erwin Jaeger, Herzogenrath, and Wilhelm Tiefels, Stolberg, both of Fed. Rep. of Germany, assignors to Saint-Gobain Industries, Neuilly-sur-Seine, France

Filed Jun. 23, 1978, Ser. No. 918,572

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1977, 2728968

Int. Cl.[2] B65D *71/00*

U.S. Cl. 206—392 **5 Claims**



1. A one piece carrier device for support of spools on a grid-work of crossed support bars, said carrier device comprising a flat, plate-like tray adapted to rest on the support bars at an intersection of two of said bars, an upper spool guide extending upwardly from the tray, a lower spool guide extending downwardly from the tray, a central axial bore extending through said tray and said upper and lower spool guides, said lower spool guide having pairs of elongated vertical slots arranged to receive said intersecting bars, resilient gripping devices comprising pairs of resilient jaws downwardly depending from said tray at positions outboard from said axial bore, said jaws being adapted to resiliently grip said support rods at positions equidistantly spaced from said axial bore.

4,202,449

PROTECTING DEVICE FOR EDGES

Anders Bendt, Nordlige Bjergevej 5, DK - 8270 Hojbjerg, Denmark

Filed Feb. 13, 1978, Ser. No. 877,507

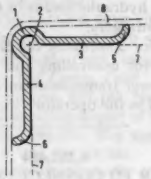
Claims priority, application Denmark, Feb. 24, 1977, 802/77

Int. Cl.[2] B65D *81/02, 85/30*

U.S. Cl. 206—453 **1 Claim**

1. A protecting device for edges with annular, generally right angular cross section, said device comprising an angular shaped elongated extruded plastic rod having a uniform cross

section along its entire length and a substantially constant material thickness across its width, the vertex of the rod angle having an outward protruding acruate shape covering substantially threequarters of a circle, and each of the sides of the rod angle having at a distance from the vertex circle at least one wave shaped outward protrusion with a height equal to or



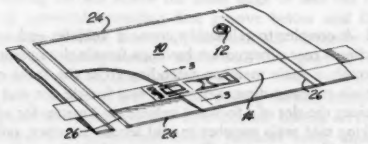
exceeding that of the arcuate shaped vertex of the rod angle, said vertex circle being connected with said wave shaped outward protrusion by substantially flat portions of said rod which are adapted to abut areas adjacent edges to be protected such that loads applied to said rod are transmitted to said flat areas and not to said edges.

4,202,450

FLEXIBLE WALL POUCH WITH LABEL

Bryan G. Howell, Montreal, and Gordon H. Ringrose, Pointe Claire, both of Canada, assignors to Twinpak Ltd., Dorval, Canada

Filed Feb. 6, 1979, Ser. No. 9,789
Int. Cl.[2] B65D *75/28*
U.S. Cl. 206—459 **3 Claims**



1. A flexible transparent pouch having at least a double wall, a heat sealed bond at the extremities thereof, a strip of flexible material having a label extending between the bonds and located between a pair of films making up the double wall, the strip being connected to the extremities of the pouch at the heat sealed bonds.

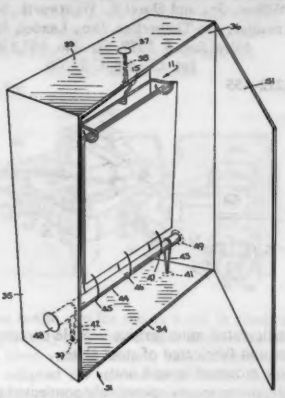
4,202,451

HANGER FOR HANGING FABRIC

Milton Berkowitz, 500 E. 85th St., New York, N.Y. 10028

Division of Ser. No. 668,928, Mar. 22, 1976. This application Mar. 23, 1978, Ser. No. 889,528
Int. Cl.[2] B65D *85/16*
U.S. Cl. 206—526 **14 Claims**

1. A package for use in transporting fabric, comprising:
means for enclosing the fabric;
hanger means adapted to pierce and support the fabric in a substantially vertical disposition;
means for supporting said hanger means, said means for supporting being connected to said means for enclosing and said hanger means being detachable from said means for supporting;
means for variably tensioning the fabric; and
means, connected to said means for enclosing, for restraining lateral movement of the fabric and for distributing tension to the fabric so that the fabric is not crushed or bent



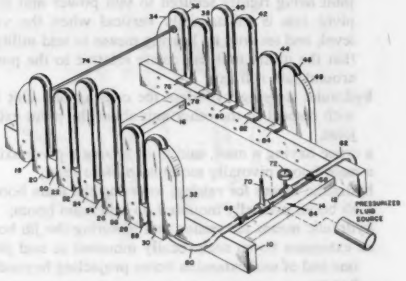
during transportation or movement of the fabric, and so that the fabric is not damaged by the tension.

4,202,452

SUPPORTING RACK FOR BREAKABLE ARTICLES

Joseph R. McCormick, P.O. Box 846, Orange, Tex. 77630

Filed May 9, 1978, Ser. No. 904,310
Int. Cl.[2] B65D *85/48*
U.S. Cl. 211—41 **12 Claims**



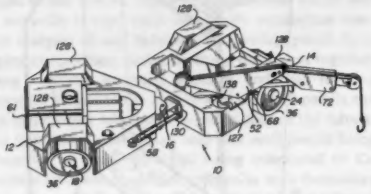
1. Apparatus for supporting flat sheet-like breakable articles comprising:
a base;
a plurality of elongated members affixed in upstanding relationship to said base and being arranged in two parallel rows of equal number in spaced apart relationship, the spaces between said members in one row cooperating with the spaces between said members in the other row to receive said flat sheet-like articles;
expandable tubing arranged in a continuous serpentine manner on the facing surfaces of the interstices of adjacent ones of said elongated members, whereby said continuous tubing cooperates with said spaces to define lines of contact between said continuous tubing and said flat sheet-like articles which is substantially the height of said elongated members; and
manifold means connected to the ends of said tubing and having an inlet for receiving fluid from a pressurized fluid source, whereby said tubing is expanded so as to be brought into contact with substantially the entire line of contact between said upstanding elongated members and said flat sheet-like articles.

4,202,453

ARTICULATED MINE SERVICE VEHICLE

Ted W. Wilkes, Jr., and Darel L. Wentworth, both of Lander, Wyo., assignors to Timberline, Inc., Lander, Wyo.

Filed Jan. 5, 1978, Ser. No. 867,126
Int. Cl.[2] B66C *23/06*
U.S. Cl. 212—55 **5 Claims**



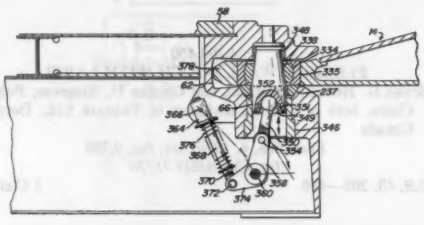
1. An articulated mine service vehicle comprising:
a power unit fabricated of steel plate;
an engine mounted in said unit;
hydraulic pump means operatively connected to said engine;
a first pair of drive wheels directly secured to said unit on opposite sides thereof;
a utility unit fabricated of steel plate and having front, rear, bottom and side walls, which walls substantially define a right parallelepiped;
a second pair of drive wheels directly secured to said utility unit on opposite sides thereof;
a hydraulic motor operatively connected to each wheel;
hydraulic brake means operatively connected to each power wheel;
a pneumatic tire mounted on each power wheel;
an articulated joint having a pivot axis and a roll axis, said joint being rigidly secured to said power unit so that its pivot axis is substantially vertical when the vehicle is level, and secured by bearing means to said utility unit so that the utility unit can rotate relative to the power unit around said roll axis;
hydraulic steering cylinders for causing one unit to pivot with respect to the other unit about the pivot axis of said joint;
a crane having a mast, said mast having a pivot axis;
a main boom pivotally mounted on said mast;
hydraulic means for raising, lowering the main boom;
a jib boom pivotally mounted on said main boom;
hydraulic means for raising and lowering the jib boom;
an extension boom reciprocally mounted in said jib boom, one end of said extension boom projecting beyond said jib boom;
hydraulic means for extending and retracting said extension boom;
a hydraulic powered winch mounted on said mast;
a weighted hook;
cable means for connecting the weighted hook to the winch, said hook hanging from said one end of the extension boom;
means for mounting the mast of said crane in said utility unit so that said mast can pivot about its pivot axis, so that said pivot axis of said mast is substantially vertical when said utility unit is level, and so that said pivot axis substantially intersects the centerline of said utility unit, said mast being located within the utility unit substantially as close to the articulated joint as possible;
hydraulic powered pivot means for causing the mast of the crane to pivot about is pivot axis;
a pair of hydraulic outriggers located substantially at the intersection of the front and side walls of said utility unit, remote from said articulated joint;
an operator's compartment in the utility unit;
first hydraulic power transmission means for applying hydraulic fluid under pressure from the hydraulic pump means to the hydraulic motors operatively connected to said drive wheels and to the brake means for each power wheel;
second hydraulic power transmission means for applying hydraulic fluid under pressure from the hydraulic pump means to the hydraulic steering cylinders;
third hydraulic power transmission means for applying hydraulic fluid under pressure from the hydraulic pump means to the hydraulic means of the crane, to the winch, and to the outriggers;
control means for controlling the engine;
control means for controlling the first, second and third hydraulic power transmission means, said control means being located in the operator's compartment.

4,202,454

COUPLER TO CONNECT CONVERTIBLE RAIL-HIGHWAY VEHICLES END TO END

Kenneth A. Browne, Lexington; Alan R. Cripe, Richmond, both of Va., and Eugene Hindin, Valley Forge, Pa., assignors to Bi-Modal Corporation, Greenwich, Conn.

Division of Ser. No. 810,120, Jun. 27, 1977. This application Aug. 28, 1978, Ser. No. 937,479
Int. Cl.[2] B60F *5/14*; B61D *15/00*; B61G *1/02, 5/00*
U.S. Cl. 213—86 **4 Claims**



1. A coupler to releasably connect vehicles end to end including a rear sill structure having a female slot opening therethrough, a male member extending from the front of a rear vehicle of lesser dimensions than said female slot and adapted to enter the slot of a forward vehicle, and means for releasably locking said male member in said female member, said releasable locking means including a vertical hole through said male member, a bushing in said vertical hole through said male member whose outer surface is spherical, and a spherical seat recessed in said rear sill structure upon which said male member rests to thereby provide limited rolling and pitching action between the coupled vehicles, a vertical locking pin, said spherical seat, said vertical hole and said vertical locking pin having the same vertical axis, and linkage means interconnected between said locking pin and said rear sill structure to selectively bias and extend said locking pin through said vertical hole to effect coupling and to retract said locking pin from said vertical hole to effect uncoupling.

4. A coupler to releasably connect vehicles end to end including a rear sill structure having a female slot opening therethrough, a male member extending from the front of a rear vehicle adapted to enter the slot of a forward vehicle, and means for releasably locking said male member in said female member, said releasable locking means including a vertical hole through said male member, a bushing in said vertical hole whose outer surface is spherical, and a spherical seat recessed in said rear sill structure upon which said male member rests to thereby provide limited rolling and pitching action between the coupled vehicles, a vertical locking pin, said spherical seat, said vertical holes and said vertical locking pin having the same vertical axis, and linkage means interconnected between said locking pin and said rear sill structure to selectively bias and extend said locking pin through said vertical hole to effect coupling and to retract said locking pin from said vertical hole

to effect uncoupling, said linking means forming an over-center toggle.

4,202,455

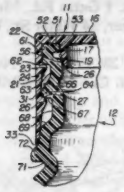
MOLDED PLASTIC CONTAINER FOR USE WITH A CAP HAVING INNER AND OUTER SKIRTS

George W. Faulstich, San Carlos, Calif., assignor to Three Sisters Ranch Enterprises, San Carlos, Calif.

Continuation-in-part of Ser. No. 852,189, Nov. 16, 1977, Pat. No. 4,162,736, and a continuation-in-part of Ser. No. 885,619, Mar. 13, 1978, Pat. No. 4,166,552. This application Mar. 1, 1979, Ser. No. 16,502

Int. Cl.[2] B65D *1/40*

U.S. Cl. 215—31 1 Claim



1. A container formed of thin-walled molded plastic material for use with a cap having a top disk, an inner skirt depending from said top disk having a substantially vertical outer wall and an outer skirt depending from said top disk, said container having a neck, said neck having a horizontal inwardly turned flange having a substantially flat top surface, the interior surface of said neck having a substantially vertical short first internal sealing surface below the inner edge of said flat top surface, an outward extending first groove below said first internal sealing surface, a second very smooth vertically extended internal sealing surface below said first groove, said first groove separating said first and second vertical internal sealing surfaces, said second internal sealing surface being of slightly lesser diameter than said first internal sealing surface, said first and second internal sealing surfaces being dimensioned so that said vertical outer wall of said inner skirt will seal against both of said first and second internal sealing surfaces, a second outward extending groove below said second internal sealing surface, and a lower internal vertical surface below said second groove of slightly lesser diameter than said second internal sealing surface, the exterior surface of said neck having a first external vertical surface extending below the outer edge of said flat top surface, the lower edge of said first external vertical surface being at an elevation intermediate the elevations of the top and bottom edges of said second internal sealing surface, said first external vertical surface terminating at its lower edge in a horizontal inwardly extending first shoulder, a second external vertical surface below said first shoulder of substantially lesser diameter than said first external vertical surface, an external bead below said second external vertical surface having an outwardly-downwardly slanted upper surface and and a second horizontal inwardly extending shoulder, a third external vertical surface below said external bead and an outward-downward sloping breast below said lower internal vertical surface, a bumper ring below said beast spaced substantially below said lower internal vertical surface, said bumper ring slanting downwardly outwardly to a maximum diameter substantially greater than the portion of said neck above said bumper ring and having an external bead forming a substantially horizontal shoulder, said neck terminating in an outward-downward slanted portion of said container of larger size than said neck.

4,202,456

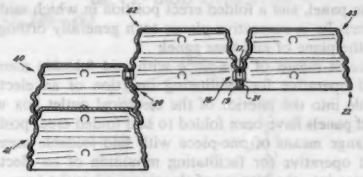
TOY UTILIZING USED, DISCARDABLE ITEMS SUCH AS BOTTLE CAPS AND BEVERAGE CANS

David Silber, 1320 53rd St., Brooklyn, N.Y. 11219

Filed Feb. 27, 1978, Ser. No. 881,784

Int. Cl.[2] B65D *51/24*

U.S. Cl. 215—228 8 Claims



1. A twist-on bottle cap for use as a toy in constructing an assembly of a plurality of identical such bottle caps attached to each other to form various shapes, and comprising a tapped body portion adapted for normal attachment to a threaded bottle top, a top portion adapted to be securely received within the body portion of an identical bottle cap, and a plurality of punch-outs positioned at spaced intervals around the periphery of said bottle cap.

4,202,457

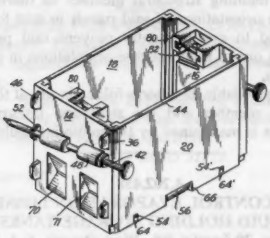
FOLDABLE ELECTRICAL OUTLET BOX

Hakki M. Tansi, Woodbury, N.Y., assignor to Eagle Electric Mgf. Co., Inc., Long Island City, N.Y.

Filed Aug. 25, 1978, Ser. No. 936,862

Int. Cl.[2] H02G *3/08;* B65D *7/24*

U.S. Cl. 220—3.3 33 Claims



1. A substantially planar molded synthetic plastic material blank adapted for erection into an electrical outlet box of the type in which electrical devices such as switches, electrical receptacles, convenience outlets and the like are mounted, said blank comprising:

(a) a substantially planar, synthetic plastic material, foldable member having

(i) a generally planar base panel having a pair of opposite longitudinal edges and a pair of opposite transverse edges,

(ii) a first pair of generally planar side panels each having an inner edge located at and connected to a respective one of said longitudinal edges to thereby form a respective common edge therewith,

(iii) a second pair of generally planar side panels each having an inner edge located at and connected to a respective one of said transverse edges to thereby form a respective common edge therewith, and

(iv) each pair of said first and said second pairs of side panels extending transversely away from said longitudinal and said transverse edges, respectively, along a pair of directions which are substantially orthogonal to one another to thereby form a generally cross-shaped configuration;

(b) living hinge means of one-piece with said foldable member and being located lengthwise along each of said common edges, and being operative for facilitating folding of said side panels relative to said base panel about respective axes along which each of said common edges extends between a generally flattened position in which said side panels lie generally in the same plane as the plane of said base panel, and a folded erect position in which said side panels lie in respective planes each generally orthogonal to the plane of said base panel;

(c) access means of one-piece with said foldable member, and operative for facilitating insertion of an electrical cable into the interior of the electrical outlet box when said panels have been folded to said folded erect position;

(d) flange means of one-piece with said foldable member, and operative for facilitating mounting of an electrical device into the interior of the electrical outlet box;

(e) engaging means of one-piece with said side panels, and operative for engaging a side panel of said first pair to a side panel of said second pair when said panels have been folded to said folded erect position, said engaging means including

(i) a pair of tabs each projecting from an opposite lateral edge of one of said pairs of side panels, each tab having a nail-receiving opening, and

(ii) a pair of slots each immediately adjacent an opposite lateral edge of the other of said pairs of side panels, each slot being dimensioned for receiving each corresponding tab when said panels are in said folded position; and

(f) means for securing the electrical outlet box in said folded position to a building structural member, and also for maintaining the structural integrity of the box in said folded position, including

(i) a pair of mounting nails each being insertable through a respective nail-receiving tab opening for attachment to the building structural member to thereby fix the relative orientations of said panels in said folded position and to concomitantly prevent said panels from moving out of their relative orientations in said folded position,

whereby the foldable member is folded in situ at the building structural member and the structural integrity of the folded box is maintained by the mounting nails.

4,202,458

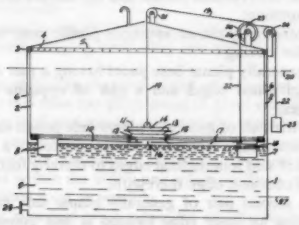
DEVICE TO CONTROL EVAPORATION LOSSES FROM LIQUID HOLDING STORAGE TANKS

Arnold Gunther, 29 Lorelei Rd., West Orange, N.J. 07052

Continuation-in-part of Ser. No. 871,806, Jan. 24, 1978, abandoned. This application Dec. 13, 1978, Ser. No. 969,176

Int. Cl.[2] B65D *89/04, 89/16*

U.S. Cl. 220—85 B **2 Claims**



1. A device to control evaporation losses from liquid holding storage tanks comprising, in combination,

a. a liquid holding storage tanks,

b. a cylindrical, open top, closed bottom, thin walled, collapsible container, loosely fitting into said tank and occupying substantially said tank volume, the top portion of said container being fastened and sealed to the upper portion of said tank's shell, the bottom of said container floating on the liquid contained in said tank,

c. a variable capacity container capable of expanding and contracting in the vertical direction and having its weight supported by counterweighing means,

d. a chain riding over a sprocket, fastened by one of its ends to the bottom of said collapsible container and by the other end to said counterweighing means, a drum which rotates about the same axis as the said sprocket, a cable with one of its ends wrapped around said drum and by its other end fastened to said variable capacity container,

e. connecting means between said variable capacity container and the annular gap comprised between said tank's shell and said collapsible container.

4,202,459

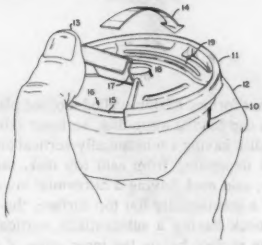
DISPOSABLE CUP COVER

Lawrence T. DeParales, 1 Gates Rd., Marshfield, Mass. 02050, and Edward P. Billitzer, 24 Water St., East Weymouth, Mass. 02189

Filed Aug. 25, 1978, Ser. No. 936,796

Int. Cl.[2] A47G *19/22*

U.S. Cl. 220—90.4 **1 Claim**



1. A disposable cup cover comprising,

a flat plastic disc having in combination,

a perimeter extending downwardly for engaging the edge of a cup,

a pie shaped segment disengagable from the cup cover whereby an edge of the cup is exposed for drinking purposes,

an arcuate recess in said disc for receiving the perimeter of the pie shaped segment whereby the cover segment is disengagably held in open position during drinking

a pair of reinforcing ribs adjacent the radial edges of said segment for frictionally holding said segment in a virtually liquid sealing position when closed.

4,202,460

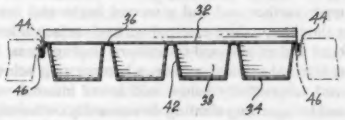
SECTIONAL FLOATING COVER

Fernand A. Imbeault, 112 St. Paul St. West, 5th Floor, Montreal, Canada (H2Y 1Z3)

Filed Apr. 13, 1978, Ser. No. 895,928

Int. Cl.[2] B65D *21/02*

U.S. Cl. 220—218 **11 Claims**



1. A sectional floating cover for storage tanks and similar vessels, comprising a plurality of buoyant, rigid chamber units secured together, in longitudinal rows with the chamber units in end-to-end relation in each row to form a continuous, rigid

deck floating on the surface of the liquid in the storage tank, each chamber unit being rectangular in plan view and having straight longitudinal edges and straight end edges, each chamber unit consisting of an upper, flat rectangular sheet, a lower corrugated sheet coextensive with said upper flat sheet and joined to said upper flat sheet, said corrugated sheet forming a plurality of uniform upwardly opening corrugations alternating with uniform downwardly opening corrugations, said corrugations solely extending longitudinally of said upper flat sheet, the upper ridge of each corrugation abutting against, and secured to, the upper flat sheet, the marginal portions of said corrugated sheet parallel to said corrugations, forming a gas- and liquid-tight joint with the corresponding longitudinal edges of the upper flat sheet, flat sheet strips longitudinally extending across and secured in gas- and liquid-tight manner to the ends of said corrugations and to the corresponding end edges of said upper flat sheet, said sheet strips having a width greater than the thickness of the chamber unit to form edge portions freely protruding from the chamber unit, the assembly of said upper flat sheet, said flat strips and the upwardly opening corrugations closed by said upper flat sheet constituting a plurality of separate buoyant cells in each chamber unit, first connecting means formed along and co-extensive with the longitudinal edges of each chamber unit and connecting chamber units of adjacent rows one to another, each first connecting means consisting of a gas and liquid-tight and rigid beaded seam in which the contiguous longitudinal edges of said last-named chamber units are lapped, folded and pressed together, and second connecting means rigidly joining said edge portions of the sheet strips of adjacent chamber units of any given row, said first and second connecting means resisting shear stress between connected adjacent chamber units.

4,202,461

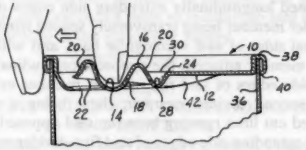
POP-OPEN CONTAINER LID

Nori Sinoto, 345 W. 58th St., New York, N.Y. 10019

Filed Jan. 11, 1979, Ser. No. 2,668

Int. Cl.² B65D *41/32*

U.S. Cl. 220—268 **11 Claims**



1. A pop-open container lid comprising a generally planar sheet formed with a first wall disposed at an angle with respect to said sheet to provide a surface against which pressure may be exerted in a direction generally parallel to said sheet, a second wall disposed at an angle with respect to said sheet, said second wall being frangible along a line, and means connecting upper ends of said walls to cause said second wall to break along said line in response to pressure exerted on said first wall generally in the direction of said sheet, a portion of said sheet adjacent to said second wall and remote from said second wall being free of obstacles over a space sufficient to render said second wall accessible to a digit of a user to permit the user's digit to engage said wall and to exert said pressure thereon in the direction of said second wall.

4,202,462

CONTAINERS HAVING LOCKING STRUCTURE

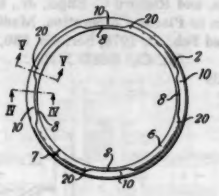
William I. Imber, St. Albans, England, assignor to Metal Box Limited, Reading, England

Filed Jan. 16, 1979, Ser. No. 3,937

Claims priority, application United Kingdom, Feb. 1, 1978, 4071/78

Int. Cl.² B65D *41/00, 41/04*

U.S. Cl. 220—293 **7 Claims**



1. A container comprising a metal container body having an access aperture with a curled rim and a cap for closing the access aperture, the cap being formed with a plurality of projections projecting radially and the curled rim of the container body having recesses therein, wherein portions of the curled rim are radially flattened so as to provide said recesses and to leave, adjacent said recesses, rim portions under which the projections on the cap can engage, the recesses being arranged to permit passage of the cap projections therethrough upon bringing the cap axially up to the access aperture, and the cap projections being arranged to engage under said rim portions adjacent the recesses when the cap is then turned, so as to secure the cap on the container body.

4,202,463

STOPPERS FOR PRESSURE CONTAINERS

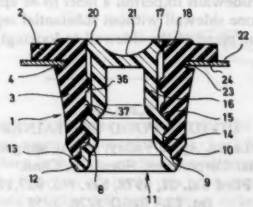
Joachim Mogler, Eppingen, Fed. Rep. of Germany, assignor to Datograf Apparatebau GmbH & Co., Heilbronn, Fed. Rep. of Germany

Filed Feb. 12, 1979, Ser. No. 11,539

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1978, 2806759; May 13, 1978, 2821051

Int. Cl.² B65D *51/16*

U.S. Cl. 220—307 **13 Claims**



1. A stopper for a pressure container which has a generally circular edge defining an opening of said container, said stopper comprising a hole fitting of resilient material with a substantially cylindrical inner bore and an inner core of substantially the same height as the hole fitting for insertion in said bore to seal thereagainst; said hole fitting having an annular external groove for receiving said generally circular edge of said container and having a main body below said groove and a flange above said groove for abutment with said container adjacent said edge, said main body converging conically to a lower secton; said inner core being upwardly insertable into said bore to seal therewith and having a flange to limit insertion, said inner core when inserted in said bore being downwardly ejectable from said hole fitting and said inner core

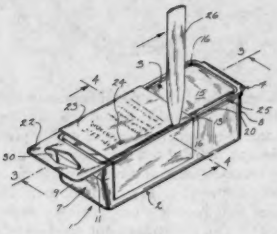
having a middle section which on insertion of said core is adjacent said main body at an upper section of said main body of larger external diameter than said opening, said middle section of said core having an external diameter which is less than the internal diameter of said inner bore at said upper section of said hole fitting.

4,202,464

RECLOSEABLE CONTAINER

Thomas J. Mohs, and Richard C. Engel, Jr., both of Madison, Wis., assignors to Placon Corporation, Madison, Wis.

Filed Feb. 22, 1978, Ser. No. 880,215
Int. Cl.[2] B65D *51/00*
U.S. Cl. 220—339 **9 Claims**



1. A reclosable container of thin flexible thermoformed plastic material comprising a rectangular container base having a generally flat bottom and planar sidewalls and front and rear end walls joining the sidewalls, a lid integrally hinged to the rear end wall and movable between open and closed positions to provide a top portion for closing and strengthening the container base, the lid having a peripheral generally V-shaped groove extending downwardly from the plane of the lid and defined by inner and outer walls joined along the bottom of the groove providing a lateral stiffening member for the lid and the container base, the outer groove wall being shaped and engaging the top inner portions of the sidewalls and end walls when the lid is in its closed position to support them against inward flexing and bending and provide a sturdy container construction, the lid having a horizontal flange in the plane of the lid overlying the top edges of the sidewalls without extending outward substantially beyond the plane of the sidewalls providing a junction with the sidewalls substantially within the plane of the sidewalls to permit a label to be applied to the lid and at least one sidewall without substantial separation of the label from the plane of the sidewall to lockingly seal the container.

4,202,465

DIVIDED FOOD CONTAINER

Edwin C. McLaren, Apple Valley, Minn., assignor to Champion International Corporation, Stamford, Conn.

Filed Jul. 21, 1978, Ser. No. 927,176
Int. Cl.[2] B65D *5/26, 5/56*
U.S. Cl. 220—468 **3 Claims**

1. A compartmentalized container for packaging, storing and heating foods comprising:

a paperboard tray formed from a one piece foldable blank having a rectangular base, said base including first and second base members and a central divider wall being of inverted V-shaped configuration, with one side of said central divider wall being hingedly connected to the transverse side of said first base member adjacent thereto, and with the other side of said central divider wall being hingedly connected to the transverse side of said second base member adjacent thereto, with said central divider functioning to define a pair of discrete food compartments on said base;

a tubular side wall, said side wall including hingedly connected first and second opposed side wall members and first and second opposed end wall members;

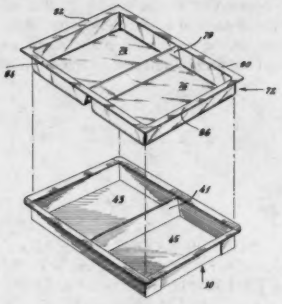
said first end wall member being hingedly connected to the other transverse side of said first base member, said second end wall member being hingedly connected to the other transverse side of said second base member, said opposed side wall members being hingedly connected to the opposed longitudinal edges of said first base member;

said tray further including a horizontally disposed flange member hingedly connected to the top edge of said tubular side wall and extending perpendicularly therefrom; and

a leak proof liner for said paperboard tray preformed from a semi-rigid blister of thermoformable material conforming generally to the interior of said paperboard tray, said blister being sealed to said tray along the flange member.

3. For use in combination with a leak proof liner, preformed from a semi-rigid blister of thermoformable material,

a blank for forming a compartmentalized food container comprising a substantially rectangular base, said base including first and second base members of substantially equal width and separated in the longitudinal direction by first and second divider members, with said second divider member being substantially identical in width to said second base member and hingedly connected thereto, with said first divider member being narrower in 'its' length then said second divider member and hingedly

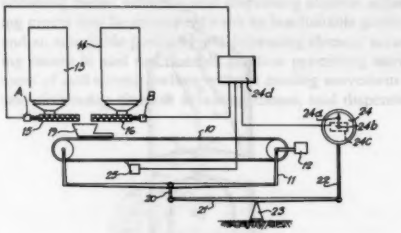


connected along one transverse edge thereto, said first divider member being hingedly connected along the other transverse edge thereof to said first base member, with the opposed longitudinally extending side edges of said first divider member being transversely spaced from the longitudinal sides of said rectangular base, and with said first base member adjacent the opposed longitudinally extending side edges of said first divider member extending to said second divider member, there being a pair of L-shaped cut lines running between said opposed longitudinally extending side edges of said first divider member and said first base member and extending between said first base member and said second divider member to the opposed longitudinal sides of said rectangular base, said cut lines aiding in the erection of said container, said blank further including a pair of opposed end wall members respectively hingedly connected to the opposed transverse sides of said base members; and a pair of opposed side wall members respectively hingedly connected to the opposed longitudinal sides of said first base member, said side wall members extending to a point intermediate the length of said second base member along the longitudinal sides thereof, said blank further including a first pair of opposed flange members respectively hingedly connected to the opposed end wall members, and a second pair of opposed flange members respectively hingedly connected to the opposed side wall members.

4,202,466
METHOD OF AND APPARATUS FOR DISPENSING PREDETERMINED PROPORTIONS OF TWO OR MORE MATERIALS

Kenneth Cook, Stockport, England, assignor to Henry Simon Limited, Stockport, England

Continuation-in-part of Ser. No. 485,945, Jul. 3, 1974, abandoned. This application Jan. 26, 1976, Ser. No. 652,047
Claims priority, application United Kingdom, Jul. 19, 1973, 34336/73
Int. Cl.² G01G 19/22
U.S. Cl. 222—1 7 Claims



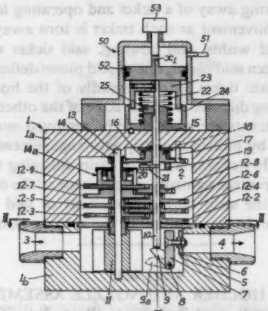
1. A method of dispensing at least two different materials in predetermined proportions in composite supply comprising the steps of dispensing one of said materials while gravimetrically sensing the rate of supply of said material, automatically establishing a steady rate of supply of said material corresponding to the required predetermined proportion of that material, subsequently dispensing another of said materials to join said material already being dispensed while gravimetrically sensing the rate of combined supply of said materials, automatically establishing said combined supply at a steady rate whereby said materials are being dispensed in accordance with the required predetermined proportions thereof, continuing said procedure if further materials are to be included until all of the materials are being dispensed in the required predetermined proportions in composite supply, the foregoing steps being carried out at reduced speed until dispensing of the composite supply in the required proportions is attained, and then the speed of dispensing of all materials being increased while maintaining said proportions, thereafter monitoring said composite supply and, in the event of a variation in said composite supply in excess of specified tolerances, automatically arresting dispensing of at least one of said materials in order to discover the source of said variation and correcting same to re-establish said predetermined proportions in the composite supply.

4,202,467
VOLUMETRIC VALVE WITH INDEPENDENT DISPLAY AND RESETTING

Pierre L. Rutten, Nimes, and Francois H. Danel, Uriage, both of France, assignors to Compagnie Nationale d'Amenagement de la Region du Bas-Rhone et du Languedoc and Assistance Industrielle Dauphinoise S.A., France

Filed Nov. 1, 1977, Ser. No. 847,610
Claims priority, application France, Nov. 5, 1976, 76 34224
Int. Cl.² F16K 31/14
U.S. Cl. 222—20 7 Claims

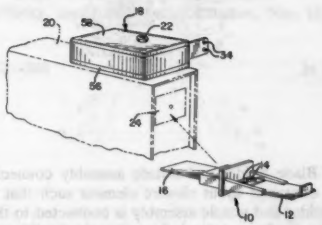
1. A volumetric valve for automatically supplying a determined and adjustable volume of liquid comprising:
a valve head;
a turbine rotated by the liquid which passes through the valve;
a gear train rotated by said turbine;
a rotary knob which enables to adjust and display said determined volume;
a cam rotated by the last pinion of said gear train, which cam automatically controls the closing of said valve head when said last pinion has rotated by a given angle;
a spiral spring which is driven in rotation by said cam;
and a sliding push rod which may be displaced in translation and which simultaneously opens said valve head, disengages said cam from said gear train and enables said cam to be brought back in its initial position by said spiral spring so that the volumetric valve is reset for a new cycle in which the same determined volume of liquid is supplied again.



4,202,468
TICKET DISPENSER FOR ASSOCIATION WITH VENDING MACHINES

David R. Anderson, Rte. 4 Box 419, Delavan, Wis. 60115; Frank Kostka, and Frank J. Kostka, both of 121 Southcote Rd., Riverside, Ill. 60546

Filed Aug. 21, 1978, Ser. No. 935,655
Int. Cl.² B65H 3/44
U.S. Cl. 221—93 5 Claims



1. In a machine of the type providing for the vending of goods or services upon the insertion of a check into the machine, said machine including vending actuating means operable only upon the insertion of checks of a predetermined value, a supply of tickets, a ticket delivery position, ticket dispensing means associated with the machine whereby a ticket is dispensed by the machine in addition to said vending, and a housing for said ticket dispensing means, the improvement wherein said ticket dispensing means incldue first pawl means for feeding said tickets one at a time to said delivery position, a drive for said first pawl means, means operatively connecting said drive to said actuating means whereby said first pawl means will feed a ticket of the delivery position only when checks of said predetermined value have been inserted in said machine, said drive reciprocating said first pawl means from a starting position to a driving position and then back to the starting position, said driving position being adjacent said delivery position, said feeding occurring during movement from the driving position to the starting position, and second pawl means located rearwardly of said starting position locking said

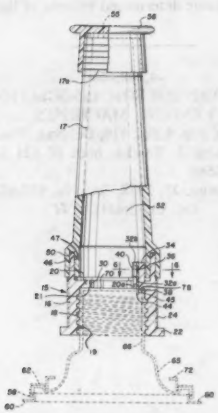
strip against reverse movement as said first pawl means moves from the starting position to the driving position, said housing defining an opening at said delivery position whereby tickets are driven one at a time through said opening, each ticket being adapted to be torn away from said strip, said first pawl means being located at said delivery position rearwardly of said opening during tearing away of a ticket and operating to hold said strip against movement as each ticket is torn away, opposed plates mounted within said housing, said ticket strip being movable between said plates, one of said plates defining a baffle for directing said ticket strip outwardly of the housing, said ticket strip being directed over the edge of the other plate, and wherein said tickets are adapted to be removed one at a time from the strip by pulling the strip into engagement with said edge, said baffle defining a curved strip engaging surface directing the strip at substantially a right angle to the direction of movement of the strip during movement of said first pawl means from the driving position to the starting position.

4,202,469

BLADE HOLDER AND NOZZLE ASSEMBLY

Michael W. Brandt, 1604 Park Blvd., Plano, Tex. 75074

Filed May 22, 1978, Ser. No. 908,161
Int. Cl.[2] B67B 7/26
U.S. Cl. 222—91 **5 Claims**



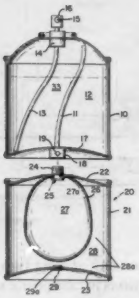
1. A Blade holder and nozzle assembly connectable to a flexible container spout closure element such that when the blade holder and nozzle assembly is connected to the flexible closure a circular opening is formed in the flexible closure and surfaces on the blade holder and nozzle assembly and on the flexible closure are urged into sealing relation, the assembly comprising: a hollow tubular body having a nozzle portion and a body portion, said body portion having an internally threaded bore in one end thereof; a shoulder inside said hollow tubular body portion intermediate opposite ends thereof, said shoulder having a central passage formed therein and having an elongated opening extending therethrough, said elongated opening being spaced outwardly from a central axis of said bore; a single, thin flat cutting blade having a pointed end and a single cutting edge; means to secure said cutting blade in said elongated opening such that as the body is threadedly secured to the spout, the cutting blade pierces the upper surface of the spout and as the body is rotated the blade cuts a circular opening in the upper end of the spout and such that the upper end of the spout adjacent the periphery of the circular opening is urged into sealing engagement with said shoulder; and a hollow cylindrical projection extending from said shoulder; said nozzle portion of said tubular body having an annular slot into which said cylindrical projection extends to secure said body portion and said nozzle portion together, said shoulder separating said nozzle from said threaded bore.

4,202,470

PRESSURIZED DISPENSERS FOR DISPENSING PRODUCTS UTILIZING A PRESSURE TRANSFER FLUID

Minoru Fujii, 5601 - 52nd Ave. S., Seattle, Wash. 98118

Continuation-in-part of Ser. No. 775,098, Mar. 7, 1977, abandoned. This application Feb. 27, 1978, Ser. No. 880,619
Int. Cl.[2] B65D 83/14
U.S. Cl. 222—130 **8 Claims**



1. A pressurized dispenser for dispensing a liquid or semi-solid product without release of the propellant dispensing the product to the surrounding environment, comprising:

container means having a valved opening holding a product to be dispensed,

a flexible wall in the container means forming a sealed compartment holding a compressible and liquefiable propellant therein liquefiable under the influence of temperature, pressure or both, out of contact with the product to be dispensed, and

means for introducing a transfer fluid under pressure into the container means, the transfer fluid in contact with the flexible wall of the compartment holding the liquefiable propellant and with the product to be dispensed, the liquefiable propellant exerting sufficient pressure on the product to be dispensed through the transfer fluid to force the product out of the container means through the valved opening when the valve is opened, wherein the container means includes a first container including the valved opening holding the product to be dispensed separate from a second container adapted to be used with the first container holding the transfer fluid and the liquefiable propellant.

4,202,471

FLUID DISPENSING ANTI-BURGLAR BOOBY TRAP DEVICE

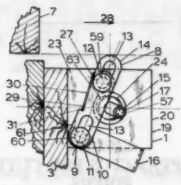
Charles R. Fegley, 1606 Frush Valley Rd., Laureldale, Pa. 19605

Continuation-in-part of Ser. No. 677,686, Apr. 16, 1976, Pat. No. 4,090,644. This application Mar. 8, 1978, Ser. No. 884,611
The portion of the term of this patent subsequent to May 23, 1995, has been disclaimed.
Int. Cl.[2] B65D 83/14; B67D 5/32
U.S. Cl. 222—153 **8 Claims**

1. A fluid-dispensing anti-burglary booby trap device for attachment to a first surface such as a wall wherein said device is associated with a second surface such as a door and arranged such that movement of said second surface will cause said device to dispense a fluid such as tear gas in the event unauthorized movement of said surface is attempted, the device comprising:

(a) a body member;

(b) a container of pressurized fluid supported in said body member, said container having a fluid-dispensing element adapted to release fluid under pressure when actuated;
(c) a passageway in said fluid-dispensing element for directing fluid from said container;
(d) means for actuating said fluid-dispensing element, said dispensing element actuating means mounted for movement and associated with said fluid-dispensing element and said second surface, said dispensing element actuating means actuating said fluid-dispensing element when it is moved by said second surface thereby causing fluid discharge;
(e) means for movably positioning said dispensing element actuating means whereby said dispensing element actuating means may be moved between an inactuatable position and an actuatable position, said dispensing element actuating means in said inactuatable position permitting movement of said second surface without causing movement of said dispensing element actuating means, said dispensing



element actuating means when in said actuatable position being in position to be moved upon movement of said second surface;
(f) mounting means associated with said body member for fastening said body member to said first surface, said body member arranged on said first surface relative to said second surface whereby movement of said second surface from a first position to a second position will engage with and move said dispensing element actuating means when said dispensing element actuating means is in said actuatable position, said dispensing element actuating means including means for retaining said dispensing element actuating means in engagement with said fluid-dispensing element when said dispensing element actuating means is moved by said second surface, said retaining means including a spring biased projection attached to and moved by said dispensing element actuating means wherein said spring biased projection engages said body member upon movement of said dispensing element actuating means to retain said dispensing element in said discharge position.

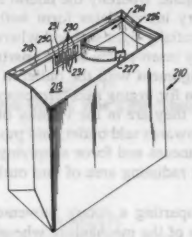
4,202,472

DISPENSER FOR INSECTICIDE OR THE LIKE

Feng Lin, 455 Ocean Ave., Brooklyn, N.Y. 11226

Division of Ser. No. 723,784, Sep. 16, 1976, Pat. No. 4,105,144.
This application May 23, 1978, Ser. No. 908,823
Int. Cl.[2] B65D *47/10*
U.S. Cl. 222—187 **6 Claims**

1. A dispensing device for dispensing materials along a wall of a container including:
at least one elongated member to hold said materials, said elongated member including a first elongated substantially U-shaped base member having a flat surface, said flat surface being attached along at least a portion of said wall, and arms extending outwardly from said flat surface to define a channel, each of said arms terminating in an outer end;
a plurality of transverse cross members attached to said base member and extending between said arms to subdivide said channel into a plurality of separate compartments;



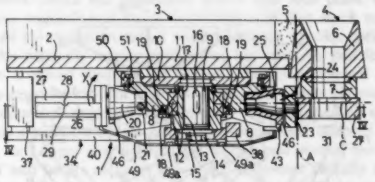
a cover strip removably attached to the outer ends of said arms and said cross members to enclose said compartments; and
a pull tab attached to said cover strip to permit said cover strip to be pulled away from the outer ends of said arms to expose at least one of said compartments.

4,202,473

REVOLVING SLIDE GATE MECHANISM

Stanislav Szadkowski, Brussels, Belgium; Daniel Amory, Dunkerque, France, and Jean M. Thomas, Xhoris, Belgium, assignors to Vesuvius International Corporation, Wilmington, Del.

Filed Nov. 2, 1978, Ser. No. 956,939
Claims priority, application United Kingdom, Nov. 15, 1977, 47515/77
Int. Cl.[2] B22D *41/08*
U.S. Cl. 222—598 **26 Claims**



1. A rotary slide gate mechanism for use on a pour vessel to control flow of molten metal through an outlet in the vessel shell, said mechanism comprising:
a moving frame able to rotate in a plane substantially parallel to the outlet in the vessel shell, around a central shaft fixed to the vessel shell;
at least two refractory plate supporting frames on the periphery of said rotary moving frame and connected thereto by means of a connection allowing each supporting frame to swivel on the one end in a rotation plane extending radially in respect to said central shaft, and on the other end around a rotation axis which is perpendicu-

lar to the axis of the rotation of said supporting frame in said radially extending rotation plane;

a number of interchangeable refractory insert plates, each plate being supported by one supporting frame in such a manner that said refractory insert plates are able to swivel around an axis which is substantially parallel to the axis of a rotation of said supporting frame in said radially extending rotation plane, whereby the lateral edges of two adjacent refractory insert plates form with respect to each other a substantially tight seal and whereby at least one of said refractory insert plates has an aperture which may be brought in alignment with the outlet in the vessel shell;

a pushing system for urging said refractory plate supporting frames, when they are in the vicinity of the outlet in the vessel shell, towards said outlet, said pushing system comprising lever means and force supplying means, removed from the heat radiating area of said outlet, acting on said lever means;

a system for imparting a rotary movement to the rotary moving frame of the mechanism; whereby the refractory insert plates may be moved in very close cooperating contact with a perforated refractory plate for the outlet in the vessel shell, so as to control the flow of metal therethrough.

4,202,474

MACHINE FOR SPREADING FERTILIZER AND SEED

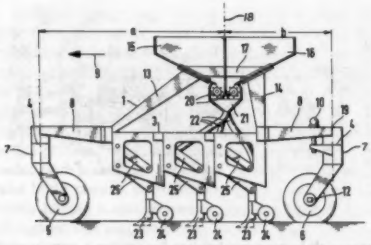
Heinz Dreyer, Hasbergen-Gaste, Fed. Rep. of Germany, assignor to Amazonen-Werke, Hasbergen, Fed. Rep. of Germany

Filed Dec. 22, 1976, Ser. No. 753,408

Claims priority, application Fed. Rep. of Germany, Dec. 31, 1975, 2559341

Int. Cl.[2] A01B 73/00

U.S. Cl. 222—609 **10 Claims**



1. A machine for spreading fertilizer and seed movable in a working direction for said spreading and in a transport direction which is at right angles to the working direction, wherein the width of said machine with respect to its working direction of travel is greater than its length with respect thereto, said machine comprising at least two individual machine units having lateral and transverse sides and assembled together in lateral relationship to each other by laterally located and extending hitch elements on each of said machine units, each of said machine units having a chassis borne at three support points disposed in a triangular array by wheels during movement in the working direction and movement in the transport direction, additional hitch elements on the transverse side towards the working direction of each machine unit, said additional hitch elements being spaced a distance c from each other on the front transverse side of each machine unit and the laterally located hitch elements on each of the machine units being spaced the distance c from each other, said wheels each being a swivally mounted wheel swivable about a vertical axis, at least one said swivel wheel on each machine unit being lockable in the working direction and in the transport direction, said assembled together machine units being pivotable with respect to each other about a pivot axis parallel to the working direction by means of said hitch elements on the lateral sides of said machine units, and being pivotable about a second pivot axis running horizontally and transversely to said working direction.

4,202,475

METHOD AND APPARATUS FOR CUTTING OPTICAL FIBERS

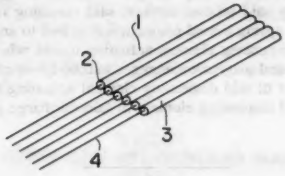
Masataka Hirai, Mito, and Koichiro Matsuno, Yokohama, both of Japan, assignors to Nippon Telegraph and Telephone Public Corp., Tokyo; Sumitomo Electric Industries, Ltd., Osaka, both of, Japan and Sumitomo Electric Industries, Ltd., Osaka, both of, Japan

Filed Jul. 28, 1978, Ser. No. 929,056

Claims priority, application Japan, Aug. 1, 1977, 52/92324

Int. Cl.[2] B26F 3/00

U.S. Cl. 225—2 **6 Claims**



1. A method of cutting at least one uncoated optical fiber using a leaf spring having a fixing portion at each end and a resilient material provided on the upper surface between said fixing portions, said method comprising the steps of:

(a) placing each said uncoated optical fiber on said resilient material in alignment with said two fixing portions;

(b) clamping each said uncoated optical fiber at each of said fixing portions;

(c) scoring the outer surface of each said uncoated optical fiber at a cutting point; and,

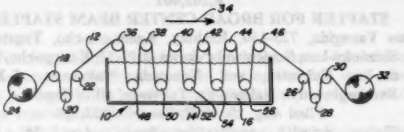
(d) arcuately flexing said leaf spring outwardly in the direction of said resilient material so as to impart a tension along the axial direction of each said uncoated optical fiber, whereby said cutting occurs at said cutting point.

4,202,476

WEB TENSIONING APPARATUS FOR A HOSTILE FLUID BATH

John R. Martin, c/o Martin Automatics Inc., 1661 Northbrook Ct., Rockford, Ill. 61103

Filed Dec. 22, 1978, Ser. No. 972,256
Int. Cl.[2] B65H *17/42, 17/22, 23/16*
U.S. Cl. 226—119 8 Claims



1. A web tensioning apparatus for maintaining tension in a web as it travels through a fluid bath comprising, in combination:

at least two rotatable web-driving rollers mounted adjacent the fluid bath, the rotatable web-driving rollers substantially parallel to each other and spaced transversely to their axes of rotation along the fluid bath;

first drive means, operably connected to one of the rotatable web-driving rollers, for driving the one rotatable web-driving roller at a pre-selected surface velocity;

at least one second drive means, operably connected to the others of the web-driving rollers, the second drive means operable in a first mode for driving the others of the web-driving rollers at a surface velocity greater than the pre-selected surface velocity and operable in a second mode for driving the others of the web-driving rollers at a surface velocity less than the pre-selected surface velocity;

at least one rotatable idler roller within the fluid bath, the idler rollers generally parallel to the web-driving rollers and positioned so that the web alternately passes across a web-driving roller and an idler roller, the idler rollers suspended from the web and substantially free to move toward and away from the web driving rollers;

means for sensing the positions of each of the idler rollers to sense (1) whether any of the idler rollers has moved toward the web-driving rollers past a first sensing position, and (2) whether any of the idler rollers has moved away from the web-driving rollers past a second sensing position; and,

control means for responding to the sensing means and controlling the mode of the second drive means so that (1) when the sensing means senses that any of the idler rollers has moved toward the web-driving rollers past the first sensing position, the second drive means operably connected to the web-driving roller which is adjacent the idler roller that has moved, in a direction away from the web-driving roller to which said first drive means is operably connected, is placed in the one mode of said first mode and said second mode which moves the idler roller away from the web-driving rollers, and (2) when the sensing means senses that any of the idler rollers has moved away from the web-driving rollers past the second sensing position, the second drive means operably connected to the web-driving roller adjacent the idler roller that has moved away from the web-driving rollers, in a direction away from the web-driving rollers to which the first drive means is operably connected, is placed in the other mode of said first mode and said second mode.

4,202,477

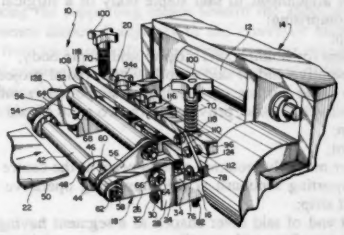
Patent Not Issued For This Number

4,202,478

STOCK CHECK AND LEAD-IN ROLL ASSEMBLY

Bernard Kula, Woonsocket, R.I., assignor to Cooper-Weymouth, Peterson, Inc., Esmond, R.I.

Filed Nov. 13, 1978, Ser. No. 960,847
Int. Cl.[2] B65H *23/10, 23/26*
U.S. Cl. 226—189 11 Claims



1. A lead-in apparatus for positioning sheet stock for feed along a straight generally horizontally oriented feed plane to a device such as a press or the like, including a stock brake assembly positioned forwardly of said device, said stock brake assembly comprising upper and lower stock checks disposed respectively above and below said feed plane with said lower stock check restricted from movement towards or away from said feed plane, said upper stock check in turn supported by an upper stock check bar positioned above said feed plane for movement towards and away therefrom such that stock may be braked by opposed contact with said stock checks, spring means for normally urging said upper bar towards said feed plane to a closed stock check attitude, levers positioned on laterally opposite sides of said feed plane, said levers pivotally supported at one point thereof, follower rolls disposed on said levers at a position above said pivot points and adapted to contact said upper stock check bar whereupon pivotal movement of said levers so as to move said followers radially upward forces said upper bar and accordingly said upper stock checks to an open stock check position against the action of said spring means.

9. A lead-in apparatus for positioning sheet stock for feed along a straight generally horizontally orientated feed plane to a device such as a press or the like, including a lead-in roll assembly positioned forwardly of said device, said roll assembly comprising a lower roll positioned transversely beneath said feed plane wherein stock passing through said lead-in assembly is supported by said lower roll, an upper roll transversely positioned above said feed plane downstream from said lower roll and supported at opposite ends thereof within a bracket, said bracket in turn supported for pivotal movement about the axis of said lower roll such that said upper roll is movable towards and away from said feed plane so as to vary

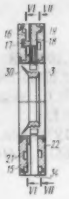
the thickness of stock which may be passed straight through said roll assembly within said feed plane such that the lower surface of said upper roll contacts the upper stock surface as it moves therepast, and means for fixing the position of said bracket with respect to said frame.

4,202,479

SURGICAL INSTRUMENT FOR SUTURING TUBULAR ORGANS WITH U-SHAPED STAPLES

Mikhail M. Razgulov, and Tamara A. Razgulova, both of ulitsa Mashinostroitelei, 32, kv. 80, Podolsk Moskovskoi oblasti, U.S.S.R.

Filed Feb. 12, 1979, Ser. No. 11,697
Int. Cl.[2] A61B 17/12
U.S. Cl. 227—8 **7 Claims**



7. An attachment to said staple body of a surgical instrument, comprising:

a strip;

a means for holding said strip to said staple body;

an operative end of said strip having a radial projection to the outer surface of which said supporting semibush is positively locked, provided with two rows of said depression;

a pivot;

a lever movably mounted on said pivot at the centre of said supporting semibush at the supporting operative end of said strip;

a first end of said lever shaped as a segment having on its inner surface said curvilinear grooves, and on its outer surface, a number of teeth for an involute meshing with said actuating lever;

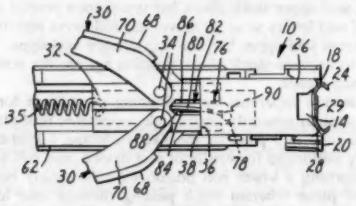
a second end of said lever adapted for said staple semiring and said segment to return into the initial position after the suturing has been over.

4,202,480

STAPLER INCLUDING MEANS FOR PREVENTING DOUBLE FEEDING OF STAPLES

Leland W. Annett, Lake Elmo, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 26, 1979, Ser. No. 14,911
Int. Cl.[2] B25C 5/02
U.S. Cl. 227—8 **9 Claims**



7. In a medical stapler comprising:

a housing having an anvil portion adapted to engage the central portion of a staple to afford closing of the staple about the anvil portion;

a ram mounted on said housing for sliding movement from a load position spaced from the anvil portion to an eject position adjacent the anvil portion, said ram having an end portion adapted to close a said staple between said ram and said anvil portion around said anvil portion during movement of said ram to its eject position; and

drive means adapted to be manually activated for moving said ram from its load to its eject position, the improvement wherein:

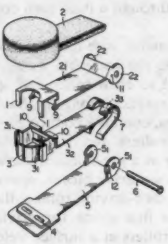
said stapler includes means for producing a click when the ram is moved fully to its eject position to provide both a tactile and an audible indication of the closing of a said staple around said anvil portion.

4,202,481

STAPLER FOR BROAD CENTER BEAM STAPLES

Jun Yanagida, 723-140, Kashiay, Kannamie-cho, Tagata-gun Shizuoka-ken; Souichiro Ishikawa, 2-27-12, Kasuga-cho, Nerima-ku, Tokyo-to, and Kazutada Nakazawa, 5-26-19, Kamisaginomiya Nakano-ku, Tokyo-to, all of Japan

Filed Aug. 10, 1978, Ser. No. 932,554
Claims priority, application Japan, Aug. 24, 1977, 52/112222[U]
Int. Cl.[2] B25C 5/02
U.S. Cl. 227—145 **2 Claims**



1. A stapling machine comprising in combination:

(a) a base plate having a wire staple receiving recess on one end part thereof, a pair of upright flanged portions at both sides on the opposite end part thereof, and a pivot pin passing through said upright flanged portions;

(b) wire staple holding means in a generally cylindrical configuration, the transverse cross-sectional shape thereof conforming to the shape of an ornamental wire staple having a broadened center beam section which is wider than the staple points at both side thereof, said means being provided with a pair of grooves to permit passage of the staple points, and a leaf spring, one end of which is connected with said wire staple holding means, and the other end of which is partially bent in a U-shape to provide a repulsive spring force and partially formed into a hook shape to be engaged with said pivot pin;

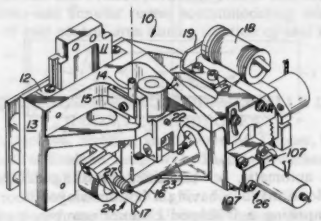
(c) a pressure applying member including a wire staple extruding member formed in a fork shape to freely slide into and out of said grooves formed in said wire staple holding means and a pair of upright flanged portions at both sides of the other end thereof forming bearings to receive said pivot pin therethrough to be pivotally connected with the upright flanged portions of said base plate; and

(d) a magnet to attract and hold in position the wire staple placed in said wire staple holding means.

4,202,482
SOLENOID ACTUATED WIRE FEED AND TEARING APPARATUS

Moshe E. Sade, Horsham; Albert Soffa, Wynnewood; Dan Vilenski, Hatboro, and William Wing, Horsham, all of Pa., assignors to Kulicke & Soffa Industries, Inc., Horsham, Pa.

Filed Nov. 22, 1978, Ser. No. 963,163
Int. Cl.[2] B23K *19/04*
U.S. Cl. 228—4.5 12 Claims



1. A solenoid actuated wire clamping apparatus for feeding a fine wire to a bonding tool and tearing the fine wire after being bonded by the bonding tool of the type employed with wedge bonding machines, comprising:

(a) a bonding head housing having two depending support arms,

(b) a bonding tool holder mounting block pivotally mounted between said arms of said housing,

(c) a pair of axially aligned hollow transducer pivot screws extending through said arms of said housing for pivotally supporting said mounting block,

(d) an actuating rod extending through each said hollow pivot screw,

(e) first and second solenoids mounted outboard on said housing,

(f) each said solenoid being adapted to engage one of said actuating rods,

(g) a wire clamp pivotally mounted on said bonding tool holder mounting block,

(h) a bonding tool holder having a bonding tool mounted therein rigidly mounted in said bonding tool holder mounting block for positioning said bonding tool in front of said wire clamp,

(i) first lever means mounted on said bonding tool holder mounting block for movement by said first solenoid through an actuating rod for articulating said wire clamp to a plurality of predetermined positions, and

(j) second lever means mounted on said bonding tool holder mounting block for movement by said second solenoid through an actuating rod for opening and closing said wire clamp whereby, said wire clamp may be actuated by said solenoids with a minimum of impact and shock force imparted to the working face of the bonding tool.

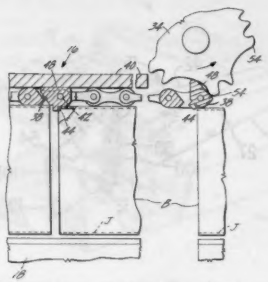
4,202,483
CAN BODY CONVEYOR WITH ANTI-ROTATION MECHANISM

Frederick S. Sillars, Beverly, Mass., assignor to USM Corporation, Farmington, Conn.

Filed Jul. 10, 1978, Ser. No. 923,337
Int. Cl.[2] B23K *1/16*
U.S. Cl. 228—43 9 Claims

1. Conveyor mechanism for successively advancing workpieces along a path to expose pre-determined portions thereof to a molten solder applicator, the mechanism comprising: a drive chain; a chain guide cooperative therewith, and a plurality of spaced lugs each having one flat side pivotally carried by the chain and respectively responsive to engagement with the chain guide to grip a portion of the respective workpieces to hold them against rotation and to move them along said path, whereby said pre-determined portions are uniformly exposed to solder from said applicator, said flat sides being disposed on a side of the chain which is remote from the pre-determined portions of the workpiece to be soldered, said flat side further engaging said chain guide.

2. In a machine for soldering the side-seam joints of successive can bodies including a molten solder applicator and means extending at least to the applicator for slidably supporting the

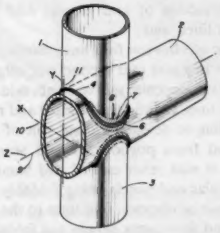


can bodies in axial arrangement and a conveyor mechanism comprising a plurality of spaced body gripping lugs, each one of which releasably engages a portion of the bodies to push them along the supporting means toward the applicator, and guide means disposed adjacent to the conveyor mechanism remote from said can body supporting means for engaging the lugs and causing the lugs to constrain movement of the bodies about their axes.

4,202,484
COMPRESSION PRESTRESSED WELD JOINTS

Marvin L. Peterson, Ponca City, Okla., assignor to Conoco, Inc., Ponca City, Okla.

Filed Nov. 20, 1978, Ser. No. 962,500
Int. Cl.[2] B23K *31/02*; F16L *13/02*
U.S. Cl. 228—173 A 5 Claims



1. A method for forming a compressively stressed weld joint joining a first tubular member to a second tubular member comprising sequentially:

(a) imparting stress into at least one of the tubular members such that release thereof will compressively stress the weld joint,

(b) welding the first tubular member to the second tubular member, and

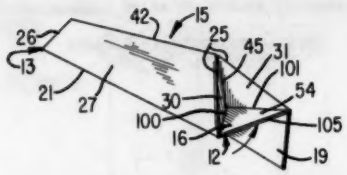
(c) releasing the stress imparted in step (a) such that the weld of step (b) is in compressive stress.

4,202,485

CONTAINER AND BLANK THEREFOR

Edwin A. Fremion, West Alexandria, Ohio, assignor to Dyna Con Packaging Inc., Hamilton, Ohio

Filed Jun. 9, 1978, Ser. No. 914,148
Int. Cl.² B65D 5/10
U.S. Cl. 229—22 18 Claims



1. A blank for forming a container of triangular section, comprising:

(a) a rectangular first outer panel free of fold lines and having a first side edge,

(b) a second outer panel connected to said first outer panel along a first fold line on the side of said first outer panel opposite said first side edge,

(c) a third outer panel connected to said second outer panel along a second fold line on the side of said second outer panel opposite said first outer panel, and having a second side edge on the side of said third outer panel opposite said second outer panel,

(d) neither of said second and third outer panels extending beyond said first panel at either end,

(e) a first pair of chevron fold lines starting at the ends of said first fold line and said second side edge at one end of said blank and converging toward and meeting at said second fold line to define a first pair of triangular end panels formed from portions of said second and third outer panels at said one end of said blank, said triangular end panels being foldably connected by said chevron fold lines to the remainders of said second and third outer panels, and foldably connected to one another along the segment of said second fold line between said one end of said blank and the intersection of said second fold line with said chevron fold lines, and

(f) a second pair of chevron fold lines starting at the ends of said first fold line and said second side edge at the other end of said blank opposite said one end, said second pair of chevron fold lines converging toward and meeting at said second fold line to define a second pair of triangular end panels formed from portions of said second and third outer panels at said other end of said blank, said second pair of triangular end panels being foldably connected by said second pair of chevron fold lines to the remainders of said second and third outer panels, and foldably connected to one another along the segment of said second fold line between said other end of said blank and the intersection of said second fold line with said second pair of chevron fold lines,

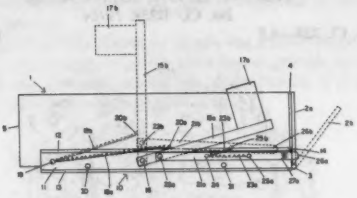
(g) said panels and fold lines being proportioned and spaced whereby, upon folding of said blank along said fold lines with said first side edge of said first outer panel substantially engaging said second edge of said third panel, said panels define a container of triangular section with said triangular end panels closing the opposite ends thereof and the end edges thereof seated on said first panel.

4,202,486

AUTOMATICALLY SIGNALING MAILBOX

Wilbur M. Tipsword, 1603 Monroe Ave., Charleston, Ill. 61920

Filed Mar. 14, 1979, Ser. No. 20,417
Int. Cl.² A47G 29/12
U.S. Cl. 232—35 1 Claim



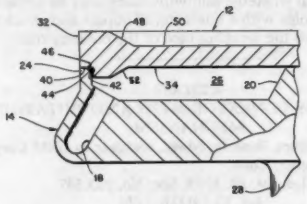
1. An automatic, self-contained signaling device directly attachable to mailbox having a bottom-hinged door, said device comprising a U-shaped channel member, a signal flag support rod having a signal flag attached to the upper end thereof and the lower end thereof pivotally attached to said channel member, means, anchored on the side of said signal rod pivot opposite said door of said mailbox, for biasing said signal rod toward an upright position, trigger means for said signal flag, said trigger means including a trigger rod element one end of which is pivotally connected to said signal flag rod between said signal rod pivot and said flag and the other end of which extends toward the door of said box and, adjacent said door, bends inwardly toward said box to terminate in a finger element, said finger element being shaped to be adapted to extend between the flanges of said channel member and engage the edge of said door of said box when said door is in the closed position, said trigger means also including means for biasing said trigger rod element toward said channel so as to cause said finger element to slide between said flanges of said channel member when said signal flag support rod is rotated toward said door, said finger element being latchable within the flanges of said channel member by the said two biasing means and being releaseable from said latched position by said door of said box when said door is opened, and means for connecting said device to said box.

4,202,487

LIPOPROTEIN ROTOR LID

John R. Edwards, Mountainview, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Feb. 22, 1978, Ser. No. 879,939
Int. Cl.² B04B 7/02, 7/08
U.S. Cl. 233—1 A 4 Claims



1. A centrifuge rotor apparatus comprising:

a lower rotor portion having a plurality of cavities for receipt of sample carrying containers;

a lid having a flat and solid contiguous central area;

means projected from the bottom surface of said lid for connecting said lid to said lower rotor portion;

a rim area portion on said lid around the periphery of said flat central area;

means on said rim portion of said lid responsive to centrifu-

gally induced forces during rotation of said rotor for deflecting said rim portion of said lid toward said lower rotor portion, said central area of said lid being thinner than said rim portion to enhance deflection of said central area for establishing sealing engagement between said rim portion and the perimeter area of said lower rotor portion during centrifugation; and

an annular recess located in the top surface of said lower rotor portion, said recess being located radially between a central hub and a raised perimeter area of said lower rotor portion, said annular recess accommodating said deflection of said central area during rotation of said rotor.

4,202,488

PENDULUM SUSPENDED HYDRAULICALLY DRIVEN BASKET CENTRIFUGES

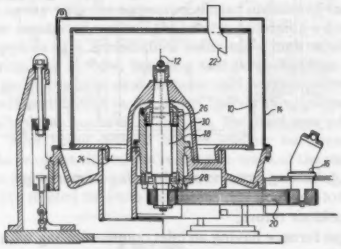
Joseph F. Jackson, Halifax, and Edward M. Cooper, Huddersfield, both of England, assignors to Thomas Broadbent & Sons Limited, West Yorkshire, England

Filed Jun. 21, 1978, Ser. No. 917,755

Claims priority, application United Kingdom, Jun. 30, 1977, 27325/77

Int. Cl.[2] B04B *9/06*

U.S. Cl. 233—24 **9 Claims**



1. In a pendulum suspended, hydraulically driven basket centrifuge having a centrifuge basket, a main spindle, a cylindrical spindle casing, means journalling said main spindle for rotation within said spindle casing about a vertical axis, said means including at least two bearing assemblies disposed at upper and lower positions on said spindle, respectively, means mounting said basket on the upper end of said main spindle, and a hydraulic motor adapted to rotate said main spindle, and hence the basket, about said vertical axis, the improvement in which said hydraulic motor, said spindle casing, said bearing assemblies and said main spindle are constructed as a cartridge unit which can be removed from the basket as a complete sub-assembly, and in which a rotary seal is disposed between the spindle and the inner periphery of the cylindrical casing at a position between the upper and lower bearing assemblies, the annular chamber so formed between the rotary seal and the upper bearing assembly being drained to atmosphere.

4,202,489

REGISTER RESETTING INTERFACE

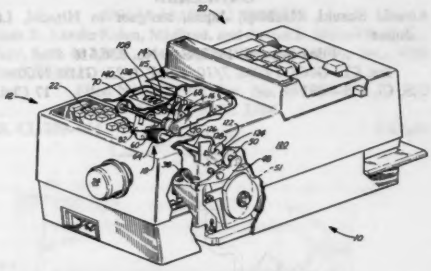
Keith E. Schubert, West Norwalk, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Jan. 26, 1979, Ser. No. 6,617

Int. Cl.[2] G07G *1/00*

U.S. Cl. 235—101 **12 Claims**

1. In a postage meter comprising a printing mechanism for dispensing postage and a register mechanism for recording the value of the postage dispensed, the register mechanism including a plurality of numeral wheels, the improvement comprising user accessible resetting means for resetting the register mechanism, a user releasable combination lock engaging the resetting means and linkage means interconnecting the resetting means and the register mechanism, the linkage means including gearing means in continuous engagement with one numeral wheel of the register mechanism and drive means in intermittent engagement with the gearing means, the drive means engaging the gearing means during a resetting cycle to rotate the one numeral wheel in one direction thereby incrementing the total postage value available for printing, the drive means being disengaged from the gearing means to permit rotation of



the numeral wheel in an opposite direction to record the dispensing of postage during a printing cycle and optional resetting means for use only by authorized official personnel, the optional resetting means including a thumb wheel, the thumb wheel being in driving engagement with the gearing means and lock means for accessing the thumb wheel, whereby the register may be reset either by the user or official personnel.

4,202,490

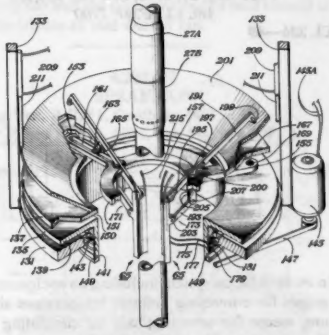
DRILL PIPE IDENTIFICATION METHOD AND SYSTEM

Walter A. Gunkel, and Robert W. Lybecker, both of San Antonio, Tex., assignors to Hughes Tool Company, Houston, Tex.

Continuation of Ser. No. 756,164, Jan. 3, 1977, abandoned. This application Jun. 23, 1978, Ser. No. 918,640

Int. Cl.[2] G06K *7/08*; E21B *47/00, 11/00*

U.S. Cl. 235—449 **33 Claims**



1. A method of identifying drill pipe sections during the handling thereof by a drilling system employed for drilling a borehole into the earth formations, said drill pipe sections having formed thereon identification numbers capable of being detected with a detecting means comprising a magnetic field detector, said method comprising the steps of:

forming distinctive identifying numbers about the circumference of the selected drill pipe sections,

said numbers having a magnetic permeability differing from that of the drill pipe section where the numbers are located,

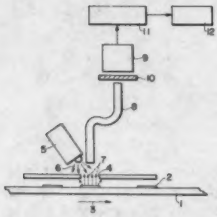
locating a detecting means comprising a magnetic field detector next to said drill pipe sections during the handling thereof by said drilling system,

rotating said detecting means around the pipe,
operating said detecting means to detect the numbers on said drill pipe sections, and
recording the numbers detected.

4,202,491
DATA CARD

Atsushi Suzuki, Hachioji, Japan, assignor to Hitachi, Ltd., Japan

Filed Sep. 26, 1977, Ser. No. 836,616
Int. Cl.[2] G06K *19/06, 7/10;* H03F *1/22;* G11B *1/00*
U.S. Cl. 235—491 **17 Claims**

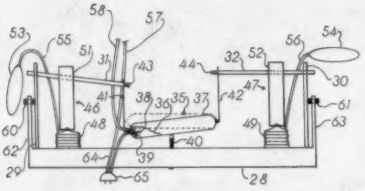


1. A data card wherein data are recorded with a powdery infrared-infrared fluorescent material, said infrared-infrared fluorescent material being at least one member selected from the group consisting of a fluorescent material containing neodymium; a fluorescent material containing neodymium and ytterbium; a fluorescent material containing ytterbium and erbium; and a fluorescent material containing neodymium, ytterbium and erbium.

4,202,492
AIR CIRCULATION SYSTEM

Larry A. Rose, P.O. Box 15, Darby, Mont. 59829

Filed Aug. 31, 1978, Ser. No. 938,462
Int. Cl.[2] F24F *7/00*
U.S. Cl. 236—49 **10 Claims**

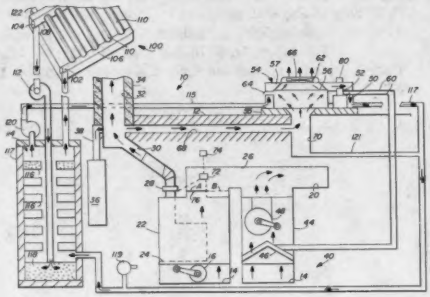


1. An air circulation system including an enclosure, air circulating means for conveying ambient temperature air into said enclosure, means for actuating said air circulating means including a supporting frame, an upwardly extending support member adjacent each end of said supporting frame, a pair of rods each having one end affixed adjacent the end of one of said support members with their free ends extending toward and spaced from one another, a mercury switch suspended between the free ends of said rods, rod deflection means disposed along the length of each of said rods, each of said rod deflection means including an expandable fluid chamber mounted on said supporting frame and operatively connected to one of said rods, a sensing element operatively connected to each of said rod deflection means, one of said sensing elements being located outside of said enclosure and the other sensing element positioned inside said enclosure, each of said sensing elements including a sealed hollow bulb connected by tubing to one of said expandable fluid chambers to form a closed atmosphere therewith, and means for electrically connecting said mercury switch with said air circulating means.

4,202,493
HEATING SYSTEM HAVING SOLAR ASSIST

Antonino Franchina, 5219 Botsford St., Sterling Heights, Mich. 48077

Continuation-in-part of Ser. No. 871,493, Jan. 23, 1978, Pat. No. 4,141,490. This application Dec. 11, 1978, Ser. No. 968,437
The portion of the term of this patent subsequent to Feb. 27, 1996, has been disclaimed.
Int. Cl.[2] G05D *23/00*
U.S. Cl. 237—2 B **8 Claims**

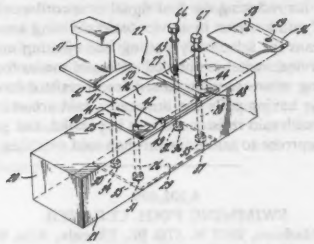


1. A heating system for a building comprising:
a hot-air duct;
a cold-air return;
a gas furnace having an inlet communicating with said cold-air return and an outlet communicating with said hot-air duct, said furnace having a combustion chamber for heating the air passing thereby from said cold-air return to said hot-air duct;
an exhaust stack for exhausting the hot gases from said combustion chamber;
a heat pump comprising a condenser with an inlet communicating with said cold-air return and an outlet communicating with said hot-air duct, said condenser heating the air passing thereby from said cold-air return to said hot-air duct, said heat pump having an evaporator located externally of said building for drawing heat from the air passing thereby;
a fan for passing air by said evaporator;
a first conduit means communicating with the heat stack to a first chamber surrounding said evaporator so that heat from the heat exhausted by said furnace may be drawn from the air via said evaporator and utilized to provide heat for said building, said furnace and said heat pump respectively communicating said cold-air return to said hot-air duct, said hot-air duct having baffle means movable from a first position permitting communication of said furnace and said heat pump with said hot-air duct, to a second position wherein said baffle permits communication from said furnace to said hot-air duct while permitting communication of air through said heat pump to said hot-air duct;
a solar panel for heating air passed therethrough having a cold air inlet and a solar warmed air outlet; and
a second conduit means communicating the solar warmed air to a second chamber surrounding said evaporator so that heat from the solar warmed air may be drawn from the solar warmed air via said evaporator and utilized to provide heat for said building.

4,202,494
RAIL MOUNTING METHOD AND APPARATUS

James A. Rumell, 6643 Winnock, Lakewood Village Apts., Indianapolis, Ind. 46220

Filed Jun. 6, 1977, Ser. No. 803,590
Int. Cl.[2] B27K *3/10, 3/15;* E01B *3/02*
U.S. Cl. 238—83 12 Claims

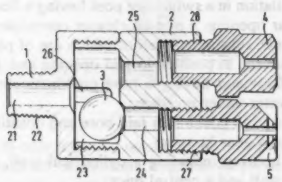


1. A method of extending the life of wooden railroad ties comprising the steps of providing a mold having a cavity for receiving the tie, supporting the tie within the cavity and closing the cavity with the respective planar surfaces of the tie spaced from associated walls of the cavity, providing a source of polypropylene at a temperature sufficiently high to allow said polypropylene to flow, injecting said polypropylene into the cavity under pressure so as to cause said polypropylene to fill any voids and cracks in the tie to form a thin protective layer on all planar surfaces of the tie, the thickness of the protective layer being defined by the spacing between the planar surfaces of the tie and the respective walls of the cavity, cooling the polypropylene to cure the protective coating, and removing the treated tie from the mold.

4,202,495
MULTIPLE NOZZLE HEAD

Josef Kranzle, Auerstrasse 42a, 7918 Illertissen, Fed. Rep. of Germany

Filed Aug. 8, 1978, Ser. No. 932,012
Claims priority, application Fed. Rep. of Germany, May 3, 1978, 2819345
Int. Cl.[2] B05B *1/16*
U.S. Cl. 239—1 11 Claims

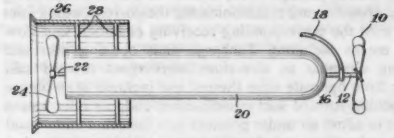


1. A method for contactless changing over of a multiple nozzle head, from nozzle to nozzle, the head containing an internal chamber, a central inlet on one side of said internal chamber and at least two outlet passageways on the opposite side of said internal chamber, said outlet passageways being arranged for connection of outlet nozzles thereto, at least one freely movable sealing element in said internal chamber and shiftable to close off at least one of said outlet passageways, the method including constructing the head in two parts with an inlet part carrying said central inlet for connection to a fluid supply line and an outlet part carrying said outlet passageways and said freely movable sealing element disposed between said parts in said internal chamber, securing said inlet part to said outlet part sealingly and releasably such that said inlet part is exchangeable, arranging said inlet centrally with respect to said outlet passageways, and moving the apparatus which carries the multiple nozzle head to swing the nozzle head upwardly and therewith move the sealing element into a neutral position for opening of more than one of said nozzles.

4,202,496
SNOW MAKING SYSTEM

James B. VanderKelen, Midland, and James L. Dilworth, Petoskey, both of Mich., assignors to Snow Machines, Inc., Midland, Mich.

Filed Nov. 6, 1978, Ser. No. 958,033
Int. Cl.[2] F25C *3/04*
U.S. Cl. 239—14 1 Claim

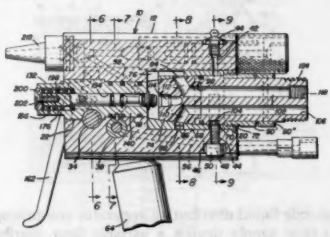


1. In a snowmaking apparatus comprising a multibladed atomizing fan and a water supply source rearwardly of the blades of said fan, said water supply source providing during operation a multiplicity of water jets onto the blades of said fan, and a power supply attached by a shaft to said atomizing fan, the improvement which comprises, including a ducted fan positioned rearward of said atomizing fan, said ducted fan during operation blowing ambient air toward said atomizing fan and wherein the blades of said ducted fan are attached to a shaft extending rearwardly of the same power supply driving said atomizing fan during operation, said shaft being on the same axis as the shaft having the atomizing fan affixed thereto, and the shroud of said ducted fan having an internal diameter of from one to about three times the diameter of the atomizing fan blades and the front end of said shroud being positioned from about two inches to about seven feet behind the blades of said atomizing fan and the rearward end of said shroud at least enclosing the blades of said ducted fan.

4,202,497
SPRAY GUN

Gary C. Ten Pas, R.R.#1, Oostburg, Wis. 53070

Filed May 5, 1978, Ser. No. 903,159
Int. Cl.[2] B05B *15/02*
U.S. Cl. 239—112 8 Claims



1. A device for mixing and dispensing fluent materials, said device including a body defining an elongated dispensing chamber therein opening, at one end, outwardly to the exterior of said body, said body further defining a pair of material receiving chambers therein for receiving different fluent materials under pressure into said body, said body defining a pair of material flow passage means therein communicating said material receiving chambers and said dispensing chamber, a pair of

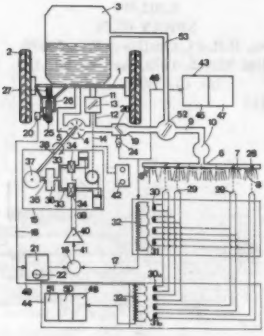
control valves in said body for controlling the flow of material through said material flow passage means from said material receiving chambers into said dispensing chamber, a pair of flow valve means in said material receiving chambers each including a material inlet passage and a material outlet passage for return of unused material from the corresponding inlet passage to the source of supply of said material from which the latter flows under pressure to said inlet passage, said control valves including means for selectively communicating and terminating communication between the corresponding receiving chamber and said dispensing chamber through the corresponding material flow passage means, said flow valve means each including means for selectively communicating the corresponding inlet passage with the corresponding outlet passage through the corresponding receiving chamber, communicating the corresponding inlet passage with the corresponding outlet passage independent of the corresponding receiving chamber and communicating the corresponding inlet passage with the corresponding receiving chamber, said flow passage means including discharge ends opening into said dispensing chamber in directions convergent toward said chamber from opposite sides thereof and inclined at an obtuse angle opening toward said one chamber end, air inlet means operative to admit air under pressure into the other end of said dispensing chamber, and throttle means within said chamber upstream from said discharge ends operative to variably throttle air flow through said dispensing chamber toward said discharge ends and to restrict the flow of air in said chamber past said throttle means to individual peripherally spaced convolution segment flow paths for effecting a swirling uniting of said individual flow paths downstream from said throttle means in substantial registry with said discharge ends.

4,202,498

LIQUID DISTRIBUTING APPARATUS AND IN PARTICULAR A FERTILIZER OR INSECTICIDE SPRAYER

Maurice C. J. Lestradet, 291, Avenue du Marechal-Delattre-de-Tassigny, 51230 Fere-Champenoise, France

Filed Aug. 22, 1977, Ser. No. 826,815
Claims priority, application France, Aug. 31, 1976, 76 26203
Int. Cl.[2] B05B *9/06*
U.S. Cl. 239—156 **2 Claims**



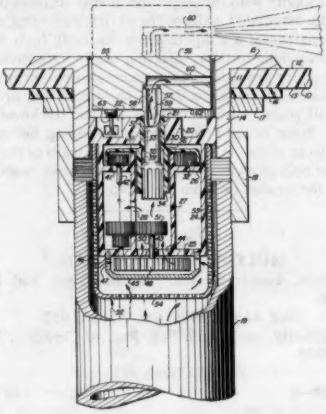
1. A mobile liquid distributing apparatus comprising a quasi-constant flow supply device, a variable flow distributing device, liquid transfer means interconnecting said two devices, a flow regulating means included in said transfer means, a regulation device acting on said regulating means and comprising comparison means, means for measuring magnitude which is a characteristic of the flow of liquid in said transfer means and emitting a first signal, means for measuring the speed of the apparatus and emitting a reference signal, means for transforming between the speed measuring means and said comparison means, said comparison means being connected to receive said first signal and said reference signal through said transforming means, said means measuring the characteristic magnitude comprising a flow measuring means, and said transforming means comprising means applying a coefficient of proportionality, said variable flow distributing device comprising ejecting means arranged in a plurality of sections, some of said sections being capable of being put out of service, dividing means provided between the flow measuring means, and the comparison means for reducing the first signal in accordance with the number of said sections in service, said dividing means comprising means for selectively putting said ejecting means sections in service, switches coupled with said means for putting said ejecting means sections in service, a resistor having sections, relays having coils and armatures, said armatures being combined with said resistor sections in parallel, and means for supplying current to said coils through said switches.

4,202,499

SWIMMING POOL CLEANER

Lester R. Mathews, 9810 N. 37th St., Phoenix, Ariz. 85028

Filed Oct. 20, 1977, Ser. No. 843,870
Int. Cl.[2] B05B *3/06*
U.S. Cl. 239—206 **1 Claim**



1. For installation in a swimming pool having a floor formed with a circular opening, a pop-up cleaner comprising the following elements, substantially all of which are of plastic:

(a) a nipple secured in position in said opening and depending from said floor and having a bore communicating with a source of water under pressure;

(b) a disk secured in position in said bore and constituting the upper end of a gear housing;

(c) said gear housing including a cylindrical wall, a bottom wall, a top wall and a central duct;

(d) a rotor rotatably mounted in said top wall depending from said top wall and including an internally toothed ring gear;

(e) a tube axially movable in said rotor and communicating with said water under pressure;

(f) means for establishing a driving relation between said rotor and said tube;

(g) a jet block positioned in the bore of said nipple above the top wall of said gear housing having a cylindrical surface and formed with an L-shaped passage opening onto said cylindrical surface and communicating with said tube;

(h) means for limiting axial movement of said tube relative to said rotor;

(i) a turbine casing secured to said bottom wall of the gear housing and including a cylindrical wall formed with water inlets communicating with said water under pressure;

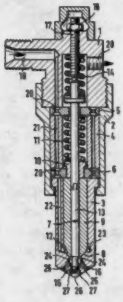
(j) an impeller within said casing and drivably mounted on a shaft journaled in said bottom wall;
(k) a gear drivably mounted on the other end of said shaft;
(l) a reduction gear train having one end connected to said gear and the other end to said ring gear;
(m) said source of water under pressure communicating with the space about said turbine casing, whereby water pressure rotates the jet block through a full 360 degrees, delivers a jet stream from the open end of the passage in the jet block, and elevates said jet block into a position in which the jet stream is above the surface of the pool floor; and
(n) a compression spring interposed between said jet block and the top wall of said gear housing for normally maintaining said jet block and said top wall spaced apart and preventing jamming when said jet block and said rotor are lowered under gravity action when said water under pressure is discontinued.

4,202,500

MULTI-HOLE INJECTION NOZZLE

Hubert Keiczek, Nuremberg, Fed. Rep. of Germany, assignor to Maschinenfabrik Augsburg-Nuernberg Aktiengesellschaft, Nuremberg, Fed. Rep. of Germany

Filed Mar. 7, 1978, Ser. No. 884,268
Claims priority, application Fed. Rep. of Germany, Mar. 9, 1978, 2710138
Int. Cl.² F02M *45/08*
U.S. Cl. 239—533.3 **24 Claims**



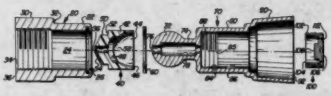
1. A multi-hole injection nozzle for air-compressing, direct-injection internal combustion engines, in particular internal combustion engines employing the method of wall deposition of the fuel comprising essentially a nozzle body and two nozzle needles held by springs in positions where the nozzle holes in the nozzle body are closed with the springs being designed so that initially while a low fuel pressure exists one nozzle needle opens whereas the second nozzle needle is lifted off its seat only at an increased fuel pressure, characterized in that one nozzle needle (9) is formed as a hollow needle and in that the second needle (13) is axially slidable in its axial bore (7) and in that the hollow needle (9) is capable of closing one or a plurality of nozzle holes (25) situated at a distance from the tip (26) of the injection nozzle and in that the second nozzle needle (13) is capable of closing one or a plurality of nozzle holes (27) situated close to the tip (26) and having different cross sectional areas.

4,202,501

CONSTANT VOLUME AERATED SHOWERHEAD APPARATUS

Kenneth H. Haynes, 1241-H E. Chestnut St., Santa Ana, Calif. 92701

Filed Mar. 23, 1978, Ser. No. 889,228
Int. Cl.² B05B *1/18, 1/30*
U.S. Cl. 239—570 **8 Claims**



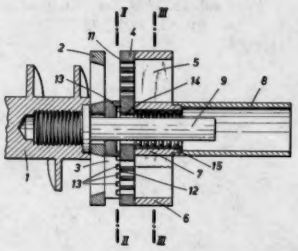
1. Showerhead apparatus for providing a substantially constant output flow of water over a wide range of input water supply pressures, comprising, in combination:
housing means, including
a first portion,
means for securing the first portion to a supply of water, and
a first bore in the housing means;
control washer means disposed in the first bore and deformable in response to the pressure of the supply of water through the control washer means, including
a second bore through which the water flows,
a conical face tapering away from the second bore on which the flow of water impinges from the first bore of the housing means, and
a first concave portion communicating with the second bore remote from the conical face into which the water flows from the second bore;
a metering orifice communicating with the first concave portion for receiving the flow of water from the second bore of the deformable control washer means,
a third bore communicating with the metering orifice and coaxially aligned with the metering orifice for receiving the flow of water from the metering orifice, and
a fourth bore through which the water flows out of the apparatus.

4,202,502

CUTTING TOOL ASSEMBLY FOR MEAT MINCER

Friedrich Laska, Linz, Austria, assignor to Imperial Chemical Industries Limited, London, England

Filed Oct. 2, 1978, Ser. No. 947,408
Claims priority, application Austria, Oct. 6, 1977, 7119/77
Int. Cl.² B02C *18/36*
U.S. Cl. 241—82.5 **2 Claims**



1. In a meat grinder, which comprises a perforated disc member having an end face, a knife member coaxial with the disc member and having a plurality of cutting blades each having an end face disposed closely adjacent the end face of the perforated disc member, each cutting blade having a shearing edge arranged to cooperate with the end face of the perfo-

rated disc member, a drive means for rotating one of the members relative to the other member, and a waste discharge device having an entrance, the improvement of each cutting blade end face defining a plurality of waste discharge grooves, each waste discharge groove having an inlet point at the shearing edge of the blade and extending from the inlet point towards the entrance of the waste discharge device, the inlet points of the grooves defining circular paths coaxial with the disc and knife members, and each groove extending in a direction deviating from the circular paths.

4,202,503

HAMMER MILL

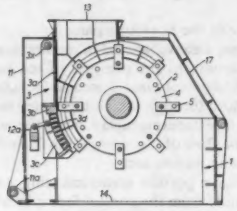
Derek Parkinson, and Jack Goose, Wakefield, both of England, assignors to Dresser Europe S.A., Brussels, Belgium

Filed May 8, 1978, Ser. No. 903,525

Claims priority, application United Kingdom, May 9, 1977, 19429/77

Int. Cl.[2] B02C *13/04*

U.S. Cl. 241—194 **5 Claims**



1. A hammer mill comprising a housing including a main part and a door pivoted to the main part for movement between open and closed positions, a rotor mounted in the main housing part, a breaker and screening assembly comprising breaker and screening parts mounted on the door to cooperate with the rotor in the closed position of the door and to provide access to the breaker and screening parts from outside the housing in the open position of the door, means to displace the breaker and screening assembly relative to the door to adjust the working clearance between the breaker and screening assembly and the rotor and means to pivot the door between the open and closed positions.

4,202,504

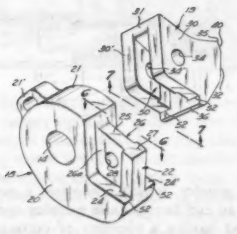
TWO-PIECE HAMMERS FOR HAMMER MILLS

Wallace C. Cameron, San Pedro, Calif., assignor to Copper Alloys Corp., Beverly Hills, Calif.

Filed Jul. 14, 1978, Ser. No. 924,500

Int. Cl.[2] B02C *13/20*

U.S. Cl. 241—194 **21 Claims**



1. A two piece hammer for use in a rotary hammer mill assembly comprising:

(a) a reusable hammer shank element having a portion adapted to receive a hammer tip element and

(b) a separate replaceable hammer tip element having striking face portion,

said hammer shank element and hammer tip element each having an interlocking portion wherein the interlocking portion of said hammer shank element comprises a plurality of substantially parallel planar impact receiving surfaces having a combined surface area greater than fifty per cent (50%) of the surface area of said hammer striking face portion, said hammer shank element being further provided with a flared portion, said interlocking portion of said hammer tip element comprising a groove portion having complemental surfaces to those of said flared portion for slidable interlocking of said flared and grooved portions along lines of juncture substantially perpendicular to the axis of rotation of said rotary hammer mill whereby to resist the thrust of centrifugal forces imposed by the rotation of said rotary hammer mill.

4,202,505

REFINER

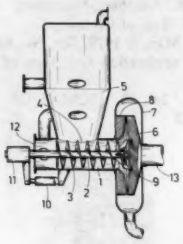
Erkki Ruuskanen, Kenraalintie 5 B 17, 37620 Valkeakoski 2, Finland

Filed Dec. 12, 1978, Ser. No. 970,398

Claims priority, application Finland, Jan. 12, 1978, 780101

Int. Cl.[2] B02C *7/14*

U.S. Cl. 241—247 **3 Claims**



1. Improvement in a refiner, including feed means feeding material to be ground, such as wood chips or paper pulp for instance, into a gap between grinding disks, a tubular jacket housing, a feed screw rotating about an axis defined by its shaft, said jacket having in a top confining wall an aperture for feeding in of material from a container located thereabove and into said jacket, said refiner having at least one rotating grinding disk, said feed screw being connected by a coupling to the rotating disk and derives its rotary motion from the rotary motion of the grinding disk, the improvement comprising said feed screw being axially loadable with the aid of a pressure cylinder against the grinding disk and can be distanced therefrom.

4,202,506

DEVICE FOR MONITORING THREAD TRAVEL

Joachim Rohner, Mönchen-Gladbach, Fed. Rep. of Germany, assignor to W. Schlafhorst & Co., Mönchen-Gladbach, Fed. Rep. of Germany

Continuation of Ser. No. 792,865, May 2, 1977, abandoned. This application Jul. 26, 1978, Ser. No. 927,964

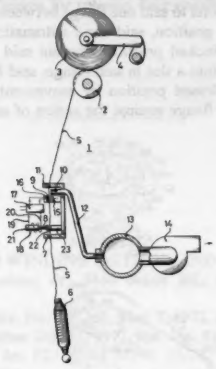
Claims priority, application Fed. Rep. of Germany, May 3, 1976, 2619430

Int. Cl.[2] B65H *63/02*

U.S. Cl. 242—36 **5 Claims**

1. Device for monitoring thread travel in a winding device of a textile machine having, disposed in the travel path of the thread from a thread supply, a thread guiding member for a take-up coil, comprising a thread monitoring device disposed

in the thread travel path upstream of the thread guiding member, said thread monitoring device having means for producing a noise signal when a thread is travelling along the path, a high-speed thread clamping device disposed adjacent the thread travel path upstream of said monitoring device along



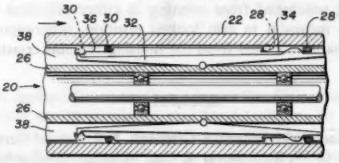
the path, means responsive to a discontinuance of the noise signal for actuating said high-speed thead clamping device to grip a thread present in the travel path, and means adjacent and downstream of said monitoring device along the path for gripping an oncoming thread end from the thread supply present in the path.

4,202,507

CHUCK ASSEMBLY

Don E. Fisher, Pensacola, Fla., assignor to Monsanto Company, St. Louis, Mo.

Filed Dec. 29, 1978, Ser. No. 974,651
Int. Cl.[2] B65H *54/54*
U.S. Cl. 242—46.2 **8 Claims**



1. A chuck for supporting a replaceable element having a cylindrical inner surface, comprising, in combination:

a. an elongated support member having a supported inboard end at one end thereof and a free outboard end at the other end thereof, said support member having a maximum dimension transverse to said axis smaller than the diameter of said cylindrical inner surface whereby said replaceable element can be placed telescopingly on said support member;

b. inboard resilient means mounted on said support member for movement therealong from a first position to a second position nearer said inboard end than said first position, said inboard means having dimensions selected such that when said replaceable element is telescopingly placed on said support member said inboard means is compressed between said surface and said support member and is moved to said second position;

c. outboard resilient means mounted on said support member for movement therealong from a third position nearer said outboard end than said first position to a fourth position between said first and said third positions, said outboard means normally resting in a fifth position in a relatively unexpanded condition smaller than the diameter of said cylindrical inner surface; and

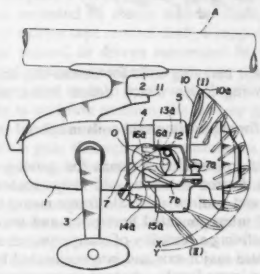
d. actuating means for moving said outboard means from said fifth position to said third position and for expanding said outboard means into compression against said surface, whereby said outboard means moves from said fifth position to said third position and subsequently toward said fourth position while said inboard means moves toward said second position.

4,202,508

SPINNING TYPE FISHING REEL

Takuo Ishida, Sennan, and Masuo Ban, Sakai, both of Japan, assignors to Shimano Industrial Company Limited, Osaka, Japan

Filed Mar. 31, 1978, Ser. No. 892,319
Claims priority, application Japan, Apr. 19, 1977, 52-45258; Jun. 7, 1977, 52-67510
Int. Cl.[2] A01K *89/01*
U.S. Cl. 242—84.2 G **11 Claims**



1. A spinning type fishing reel comprising: a mounting leg for fixing a reel to a fishing rod; a reel body having a projecting handle; means for rotatably mounting a rotary frame to the front of said reel body; means for mounting a spool at the front of said reel body so that said spool is movable longitudinally of said reel body; and means for radially pivotably supporting the bail arm of a semicircular shape to said rotary frame so that said bail arm is swingable in a given range with respect to said rotary frame, said bail arm having an intermediate portion passing across the front of said spool and being turned over in a swinging motion between two positions during its swinging movement, one position being where a fishing line is wound on said spool under guidance of said bail arm and the other position being said fishing line is released from said spool; said means for pivotably supporting said bail arm including:

at least one support for supporting said bail arm to said rotary frame, said one support being fixed to one end of said bail arm and having at least one stud about which said bail arm rotates to move relative to said rotary frame;

a bearing provided at said rotary frame to support said stud rotatably, said bearing having a slot which is elongated longitudinally of said reel body for bearing said stud therein; and,

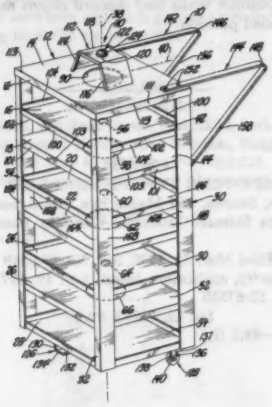
means responsive to pivotal movement of said support about said stud for causing said stud to move longitudinally along said slot, whereby when said bail arm is turned over, said stud is moved along said bearing slot forwardly of said reel to allow the intermediate portion of said bail arm to be shifted forwardly with respect to said spool.

4,202,509

COIL-CARRYING VEHICLE AND METHOD OF USING SAME

Gerald H. Horn, 6831 N. Frostwood Pkwy., Peoria, Ill. 61614

Filed Nov. 30, 1978, Ser. No. 965,120
Int. Cl.[2] B65H 75/40, 49/00
U.S. Cl. 242—86.5 R 10 Claims



1. A vehicle for carrying coils for thread-like material each of the coils having loops which define holes, said vehicle comprising:

frame means for supporting said coils in spaced relationship, and

means secured to said frame means for moving said frame means to a desired location, said frame means having a major axis and a minor axis, said frame means including a plurality of interconnected horizontal and vertical frame members defining a plurality of compartments spaced in a line along said major axis and interconnected by passages which place immediately adjacent compartments in fluid communication with each other, said passages being formed through the horizontal frame members common to adjacent compartments along the major axis of said frame means and wherein said passages are substantially aligned with the holes defined by loops of the coils along said major axis, said coils of material being disposed in their respective compartments interiorly the frame means.

4,202,510

RETRACTABLE PET LEASH

Walter F. Stanish, 118 Rochelle Ave., Philadelphia, Pa. 19128

Filed Dec. 4, 1978, Ser. No. 965,767
Int. Cl.[2] B65H 75/48
U.S. Cl. 242—107.4 R 6 Claims

1. A leash for animals comprising a housing sufficiently small to be held within a user's palm, a rotatable reel disposed within said housing, releasable latch means coupled to said reel, biasing means applying a biasing force to said reel and flexible tape means, said housing including a pair of opposed sidewalls, one of said sidewalls having a shaft projecting inward therefrom for securement to the other sidewall, said reel comprising a central hub having an opening through which said shaft extends and a pair of circular flanges projecting outward from said hub, one of said flanges including a plurality of substantially rectangular radially extending slots, each of which opens to the periphery of said flange, said tape means being secured to and wound on said hub and having a free end to which a clip is secured, said biasing means comprising a helical spring located within the opening in said central hub and connected between said reel and said shaft, said latch means comprising a resilient band, a latch plate having an elongated opening through which said shaft extends, a ledge disposed adjacent said opening, an elongated finger mounted on said plate parallel to said one flange and actuator means mounted on said plate projecting through an opening in one of said sidewalls, said resilient band being disposed about said shaft and said ledge, said finger being an elongated member arranged for reciprocal movement parallel to said one flange between a locked position and a released position, said band automatically moving said finger to said locked position wherein said finger is radially extended fully into a slot in said flange, said finger being movable to said released position by movement of said actuator parallel to said flange against the action of said resilient band,

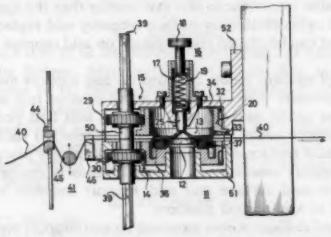
whereupon said finger is retracted fully from said slot, when said latch means is in said released position said reel being rotatable in one direction to permit said tape to be unwound from the reel and extended out of the housing by the application of tension thereon which exceeds said biasing force, said reel being rotatable in the opposite direction when said latch means is in said released position to rewind the tape on the reel when the biasing force exceeds the tension on said tape, said reel being precluded from rotating in either direction when said latch means is in said locked position, whereupon the length of tape extended from the housing remains constant.

4,202,511

THREAD BRAKING DEVICE

Gerhard Koslowski, Mönchen-Gladbach, Fed. Rep. of Germany, assignor to W. Schlafhorst & Co., Mönchen-Gladbach, Fed. Rep. of Germany

Filed Dec. 26, 1978, Ser. No. 973,030
Claims priority, application Fed. Rep. of Germany, Dec. 27, 1977, 2758334; Jul. 10, 1978, 2830205
Int. Cl.[2] B65A 59/24
U.S. Cl. 242—150 R 3 Claims



1. Thread breaking device comprising a rotatably driven lower dish and upper dish having confronting surfaces for

frictionally engaging a thread passing therebetween, a device for applying a load to the upper dish so as to urge said confronting surfaces toward each other and vary tension applied to the thread, rotary drive means for rotating said lower dish, a guidance housing surrounding and driving said upper dish, and rotary drive means for rotating said guidance housing.

4,202,512

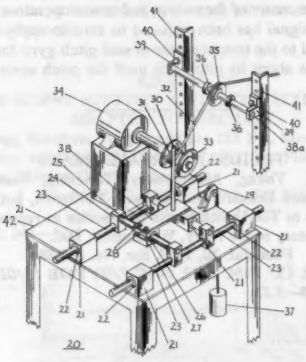
LEVEL LAYER WINDING METHOD AND APPARATUS

Thomas F. Nicholson, Jr., 3440 Belair Rd., Baltimore, Md. 21213

Continuation of Ser. No. 232,363, Mar. 7, 1972, abandoned. This application Jul. 11, 1977, Ser. No. 814,655

Int. Cl.[2] B65H *57/00, 57/28*

U.S. Cl. 242—157.1 **8 Claims**



1. A method for controlling wire or like filamentary materials while winding in successive level layers on to rotatively driven spools or reels, comprising the steps of;

urging a rigid convex filament guide means, having a cross-sectional radius slightly larger than that of the radius of the material being wound, perpendicularly toward the axis of rotation of said spool engaging the guide means with a wound coil of wire on the side of the wire opposite a previously wound coil of wire,

moving said guide means back and forth in a path parallel to the axis and substantially between the ends of said driven spool, responsive to engagement with the newly wound wire,

resisting said back and forth movement of said guide means in response to wire winding in tight level layer alignment, and,

adjusting the amount of resistance to said back and forth movement of said guide means in cooperation with said perpendicularly urging step to hold each successive wire being wound against a previously wound wire of an underlying layer or against the initially unwound core and laterally against adjacent wound coils in the layer being wound so that said guide means will exert pressure against the wire being wound on said spool in directions longitudinally of and perpendicularly to the axis of rotation of the spool.

4,202,513

TAPE END DETECTOR FOR REEL DRIVEN CASSETTE TAPE RECORDER

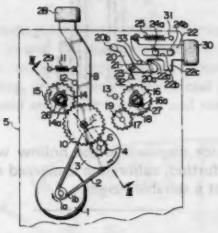
Akira Osanai, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Japan

Filed Jun. 2, 1978, Ser. No. 912,083

Claims priority, application Japan, Jun. 8, 1977, 52-74334

Int. Cl.[2] G11B *15/22, 15/30*

U.S. Cl. 242—189 **6 Claims**



1. A tape end detector for a reel driven cassette tape recorder, comprising a drive shaft mounted for rotation on a stationary baseplate a drive gear mounted on the drive shaft; a take-up gear mounted on a tape take-up shaft; a rewind gear connected to a drive tape rewind shaft; a support arm pivotally mounted for manual or driven movement between first, second, and third positions; a transmission gear rotatably mounted on the support arm so as to mesh with the drive gear and said take-up gear in said first position; the take-up gear rotating the tape take-up shaft in response to the transmission of a drive from the drive gear through said transmission gear; the transmission gear being arranged to revolve around the drive gear when the take-up gear stops rotation due to a tape end being reached and, in response to a drive from the drive gear, to cause said driven movement of the support arm to said second position to thereby provide an indication of the tape end being reached; a constraining member for maintaining a record/playback operating member in an operative position; said support arm in said second position directly engaging and actuating said constraining member to move said operating member to an inoperative position to shut off said tape recorder; said support arm in said second position being out of driving engagement with said take-up gear and said rewind gear; movement of said support arm to said third position causing said transmission gear to be moved into driving engagement with said rewind gear to rotate said tape rewind shaft, said support arm in said third position also operating to hold said constraining member in an inoperative position, and means for normally urging the support arm to said first position in which the transmission gear is in meshing engagement with the take-up gear.

4,202,514

HYDRAULIC JACK DEVICE

Cheng-Kuan Chen, 48, Kuang Ming Rd., Chia-Yi City, Taiwan

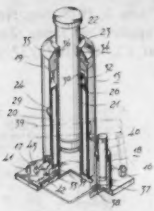
Filed Dec. 18, 1978, Ser. No. 970,205

Int. Cl.[2] B66F *3/24*

U.S. Cl. 254—93 H **4 Claims**

1. An improved hydraulic jack device comprising mainly a jack body, a base seat, a plunger pump and an oil passage device; wherein the jack body further comprising mainly an outer cylinder, an inner cylinder and a ram, the characteristic thereof being that the said outer cylinder is made of transparent or semi-transparent plastic material or the like, and is a cylindrical pipe with a hollow wall of rectangular cross section, and disposed thereon are an oil injection hole, an oil passage hole, a soft tube nozzle and a U shape notch, the said oil injection hole is connected to the oil releasing hole of the inner cylinder by means of an oil tube, the said oil passage hole communicates with the inner cylinder by means of an oil pas-

sage pipe and through a check valve, the said soft tube nozzle being communicable with the cylinder of the plunger pump through a check valve, and to the soft tube nozzle is connected



a soft tube device disposed in the hollow wall space of the outer cylinder; further, calibration is marked at a region of the outer cylinder at a suitable height.

4,202,515

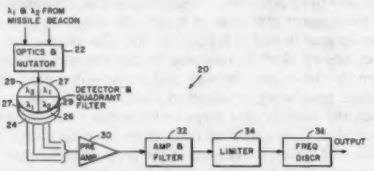
TWO TONE TRACKER

Richard F. Maxwell, Jr., Baltimore, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 5, 1978, Ser. No. 922,011

Int. Cl.[2] F42B *15/02*

U.S. Cl. 244—3.11 **6 Claims**



1. A tracking system for line-of-sight missile tracking comprising: a photoemissive beacon having first and second optical emitters disposed within a missile housing, said emitters being adapted for emitting respective first and second optical wavelength signals; tracking means remotely located from said beacon and having optically sensitive detector means responsive to said optical wavelengths for providing electrical output signals in response to impinging optical signals, amplifier means responsive to said detector means output for amplifying said electrical signals, and discriminator means responsive to said amplified signals for providing an output signal indicative of deviation of said missile from the line-of-sight of the target.

4,202,516

ELECTRONIC TRIPOD TECHNIQUE

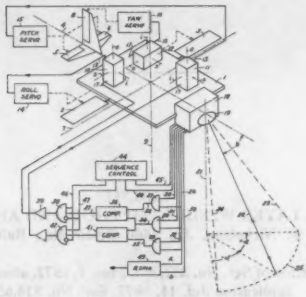
Earl H. Benser, Bloomington, Minn., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 30, 1978, Ser. No. 921,140

Int. Cl.[2] F42B *15/00*

U.S. Cl. 244—3.15 **2 Claims**

1. In a vehicle for travel at a distance above the earth's surface having roll and pitch rate gyros for stabilizing the vehicle about its roll and pitch axes, each gyro having a torque motor for applying a torque to the gyro about its output axis, apparatus for aligning said gyros to the local vertical, said apparatus comprising: means for measuring the slant range to ground in a direction depressed by a constant acute angle from the plane of the roll and pitch axes of the vehicle; means for producing an azimuthal scanning of said direction about an axis parallel to the yaw axis of the vehicle and over an angular range of ±a, where a is an acute angle measured from the plane of the roll and yaw axes of the vehicle; means for continuously deriving a roll error signal proportional to the difference between the slant ranges at the two extremes of the scanning range; means for applying said roll error signal to the torque motor of the roll gyro for rotating the vehicle about its roll axis until said roll error signal is zero; means for continuously deriving a pitch error signal proportional to the difference between the range at one extreme of said sweep and the range at the center of the sweep; and means operative after said roll error signal has been reduced to zero to apply the pitch error signal to the torque motor of said pitch gyro for rotating said vehicle about its pitch axis until the pitch error signal is zero.



4,202,517

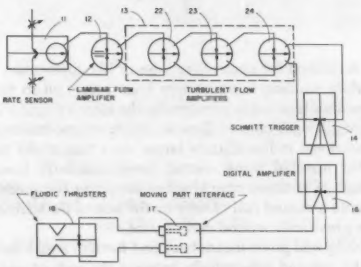
FLUIDIC INTERFACE MEANS

Robert W. Young, Montgomery Township, Montgomery County, and Leonard D. Dansbury, Levittown, both of Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 20, 1977, Ser. No. 817,884

Int. Cl.[2] F15C *1/12*; F41G *7/00*; F42B *15/02*

U.S. Cl. 244—3.22 **2 Claims**



1. An interface device having dual pistons for providing a fluidic interface between low flow fluidic circuitry and high pressure high flow fluidic thrusters having two alternately actuated control ports and operated by ram air such as in homing tactical missiles comprising:

a thruster control system including a scoop for admitting ram air into said system and a stagnation plenum for distributing ram air to said fluidic thrusters;

low flow fluidic circuitry in said thruster control system including a rate sensor;

a fluidic digital amplifier interposed between said fluidic circuitry and said interface device and having alternate ports for directing low pressure flow to said interface device pistons.

said thrusters requiring a differential pressure and/or flow

to change their thrusting direction that substantially exceeds the low flow output of said fluidic circuitry;

a pressure regulator in said thruster control system positioned to receive ram air and adapted to provide a constant low pressure flow input to said fluidic circuitry,

said interface device including a block having a piston shaft disposed opposite each of said control ports and respective ports of said digital amplifier,

the ends of said piston shafts blocking or exposing the appropriate one of said control ports thereby controlling the suction pressure at said ports so that said thrusters are made to generate their own flow control from ram air on the side having the blocked port,

said pistons having heads whose outer and inner surfaces are exposed oppositely to the flow from said digital amplifier ports generated by said fluidic circuitry so that when one piston shaft blocks its respective control port the other piston is driven oppositely to expose the other of said control ports,

said block having passages communicating between the interior of one piston chamber and the exterior of the other piston chamber to effect reciprocal motion of said pistons and assure interlocking operation thereof,

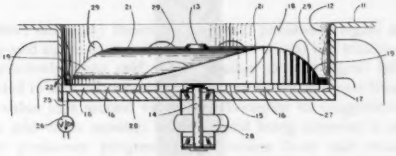
said fluidic circuitry including means for increasing the output of said rate sensor, and said interface device causing said thrusters to provide a desired corrective power jet for control of the roll, pitch and yaw rates of said missile.

4,202,518

AIR-BORNE SUPPORT AND LIFT MECHANISM ADAPTED TO AIRCRAFT

J. Kellogg Burnham, Av. Republicas 153 Bis, Mexico City 13, Mexico, and Mario H. Gottfried, Jr., Las Flores 278, Los Reyes, Mexico City 21,, Mexico

Filed Oct. 27, 1977, Ser. No. 845,933
Int. Cl.[2] B64C *21/00, 23/02*
U.S. Cl. 244—12.1 **19 Claims**



19. An apparatus for producing lift for a flying vehicle comprising a top deck of a flying vehicle having one or more shallow cylindrical wells inset thereinto, said well having a cylindrical wall and a sealed floor, a disc in each well adapted and powered for rotating therein with restricted clearance from said cylindrical wall and from the sealed floor of said well, said disc being generally parallel to the top deck surrounding said well, said disc adapted to rotate at a speed creating a reduced air pressure thereabove; a grid assembly of vertical passages is mounted above said disc in said well and means for moving at least a portion of said grid closer to the top of said disc or withdrawn an appreciable distance therefrom under the control of an operator.

4,202,519

AIRFOIL LEADING EDGE SLAT APPARATUS

John J. Fletcher, Renton, Wash., assignor to The Boeing Company, Seattle, Wash.

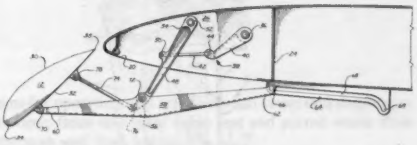
Filed Sep. 8, 1978, Ser. No. 940,708
Int. Cl.[2] B64C *3/50*
U.S. Cl. 244—214 **21 Claims**

1. In an airfoil having a forward leading edge and a rear trailing edge, a leading edge slat apparatus deployable from an under surface of said airfoil, said leading edge slat apparatus comprising:

a. a slat member having a forward end and a rear end, and having a first stowed position in said airfoil with said forward end positioned forward of said rear end, said slat member being movable from said first stowed position downwardly and forwardly to a second deployed position, and being moveable rotatably so that said rear end moves upwardly relative to said forward end, with said forward end still being positioned forwardly of said rear end,

b. a main actuating member having a forward end pivotally connected to said slat member at a first connecting location, and a rear end operatively connected to said airfoil,

c. a positioning arm having a pivot end operatively connected to said airfoil for forward and rearward rotational



movement about a first mounting location, and a swing end with second and third spaced connecting locations thereon, said actuating member being pivotally connected to said positioning arm at said second connecting location,

d. a tilting link having a first end pivotally connected to the positioning arm at said third connecting location, and a second end pivotally connected to said slat member at a fourth connecting location spaced from said first connecting location on said slat member,

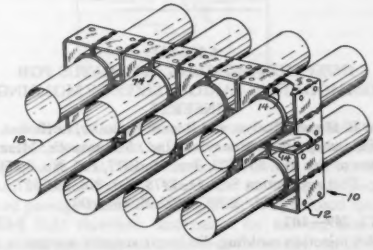
e. said first, second, third and fourth connecting locations being so arranged relative to each other that when said slat member is being moved from the stowed position to the deployed position, said tilting link coacts with said positioning arm and said main actuating member to rotate the rear end of the slat member upwardly relative to the forward end of the slat member.

4,202,520

MODULAR SUPPORT ASSEMBLY FOR TUBES

John F. Loos, and James C. Petty, both of San Diego, Calif., assignors to UOP Inc., Des Plaines, Ill.

Filed Jul. 24, 1978, Ser. No. 927,707
Int. Cl.[2] F16L *3/22*
U.S. Cl. 248—68 CB **5 Claims**



1. A modular support assembly apparatus for supporting a plurality of elongated tubes in spaced vertical and/or horizontal relationship to each other which comprises a plurality hollow, molded, modular elements having apertures in the wall portions thereof, wherein said apertures are aligned with identical apertures in another adjacently positioned modular support element, said adjacent elements being adapted to rigidly attach to one another by fastening means transversing said

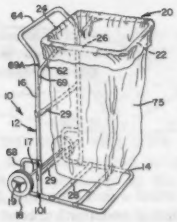
apertures, each said modular support element having four flat rigid external planar surfaces positioned to form three right angles and a concave cylindrical external wall surface portion connecting two of said four planar surfaces having its concave shape formed to engage not more than one-quarter of the circumference of said elongated tube supported thereby.

4,202,521

COMBINATION BAG HOLDER AND DOLLY

Frank M. Harding, 1303 Brush Hill Cir., Naperville, Ill. 60540

Filed Nov. 24, 1978, Ser. No. 963,302
Int. Cl.[2] A63B *55/08*; B65B *67/04*
U.S. Cl. 248—98 **7 Claims**



1. A combination bag holder and dolly of the type in which a dolly frame comprising a platform section and an upstanding section are mounted on a pair of dolly wheels, and in which a bag holding frame is rigidly supported above the platform section on the upstanding section of the frame;

the improvement in which the bag holder frame is adapted to accommodate bags of different cross sectional areas, and comprises a horizontally movable U-shaped member, the legs of which are secured to spaced supports on said upstanding section, and a pivoted U-shaped portion pivoted to said spaced supports and movable between a horizontal position and an inclined position whereby the open end of a bag may be interiorly mounted within said bag holding frame and have its open edges folded over the frame while the pivoted section is in its inclined position and then stretched to a taut, open position as the pivoted section is moved toward a horizontal position, and means for securing said horizontally movable U-shaped member to said spaced supports in a number of positions to adjust to the cross sectional area of the particular bag being mounted on said bag holding frame.

4,202,522

INJECTION MOLDING APPARATUS FOR ACCOMMODATING VARIOUS SIZES OF MOLDING DIE INSERTS

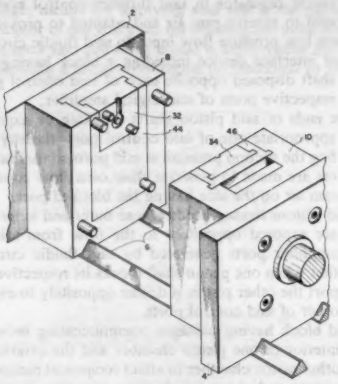
Walter E. Hanas, Roslyn, and Ronald R. Sutko, Levittown, both of Pa., assignors to Honeywell Inc., Minneapolis, Minn.

Division of Ser. No. 807,227, Jun. 16, 1977, Pat. No. 4,158,910.
This application Sep. 11, 1978, Ser. No. 941,327
Int. Cl.[2] B29C *1/00*; B29F *1/00*
U.S. Cl. 249—102 **4 Claims**

1. An injection molding die insert support apparatus comprising

a die insert support frame having at least one surface face, a recess in said face,

a plurality of die inserts having different size mold cavities with a first one of said die inserts having a large mold cavity and being sized to mate with said recess in said support frame and a second one of said die inserts having a smaller mold cavity than the mold cavity of the first insert and said second one of said die inserts being smaller than said recess and



an adaptor for adapting said second one of said die inserts to mate with said recess.

4,202,523

BORON NITRIDE/ELASTOMERIC POLYMER COMPOSITION FOR COATING STEEL CASTING DIES

Schrade F. Radtke, New Canaan, Conn., assignor to International Lead Zinc Research Organization, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 814,536, Jul. 11, 1977, abandoned. This application Dec. 6, 1977, Ser. No. 857,939
Int. Cl.[2] B22C *3/00*
U.S. Cl. 249—115 **15 Claims**

1. A method for treating the surface of a steel casting die for molten metals which comprises:

(a) preparing a uniform dispersion consisting essentially of boron nitride powder, at least one elastomeric polymer having a high-polymer an a low-polymer fraction, and an organic solvent or diluent for the polymer;

(b) applying the dispersion as a film on the die surface which contacts the molten metal; and

(c) allowing the film to dry to form a thermally insulating, lubricating and protective coating on the die surface.

4,202,524

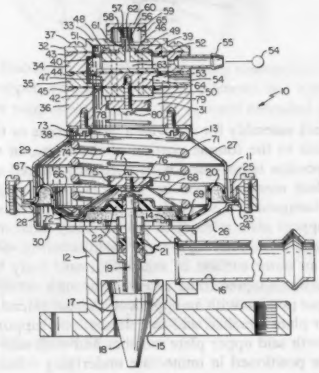
VALVE POSITIONER AND METHOD OF MAKING THE SAME

Harold G. Brakebill, Concord, Tenn., assignor to Robertshaw Controls Company, Richmond, Va.

Filed May 22, 1978, Ser. No. 908,537
Int. Cl.[2] F16K *31/12*; F02M *25/06*
U.S. Cl. 251—28 **2 Claims**

1. In a self-contained valve positioner having a single valve

positioner housing including an actuator portion and having a pneumatically operated actuator means therein carrying a main valve member to position said main valve member relative to a main valve seat in a valve unit in relation to the magnitude of a single pneumatic signal directed to said valve positioner and being utilized as the fluid source therein for pneumatically operating said actuator means includes a main flexible diaphragm operatively interconnected to said main valve member and movable in relation to a pressure differential across the main flexible diaphragm, the improvement wherein said single valve positioner housing includes a pilot valve portion and wherein said pilot valve portion has pilot valve relay means disposed therein, said relay means of said pilot valve portion having a plurality of flexible diaphragms, one of said relay means diaphragms and said main flexible diaphragm being spaced from each other to define a chamber therebetween, said relay means having passage means to direct at least a portion of said signal to said chamber to pneumatically move said valve



member, said relay means receive said pneumatic signal and cause said signal to operate said actuator means in a manner to progressively open said valve member as said signal being directed to said valve positioner progressively increases from a first value to a second value and thereafter to progressively close said valve member as said signal being directed to said valve positioner progressively increases from said second value to a third value, biasing means in said chamber biasing said valve member to a closed position when said signal is said first value, tension spring means in said chamber having opposed ends operatively interconnected to said main flexible diaphragm and one of said relay means diaphragms biasing said relay means to a position allowing said pnematic signal to communicate with said first chamber to open said valve member as said signal progressively increases from said first value to said second value, valve means biased to open by said relay means to reduce the pressure differential across said main flexible diaphragm when said signal increases to said third value to allow said valve to close by said biasing means.

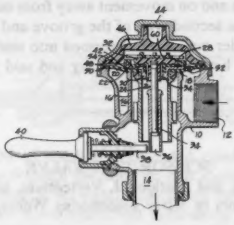
4,202,525

WATER CONTROL DEVICE FOR FLUSH VALVES

Louis E. Gorabe, Hayward; James E. Hobbs, Pleasanton, both of Calif., assignor to Chemworld Corporation, Hayward, Calif.

Filed Feb. 6, 1978, Ser. No. 875,204
Int. Cl. F16K/D *31/145*; E03K/D *3/06*
U.S. Cl. 251—40 **8 Claims**

1. In a flush valve having inlet and outlet water passages:
an upstanding barrel portion in said flush valve having a main valve seat around the top end thereof,
a flexible diaphragm having a central opening therein surrounded by a main valve seating portion,
a cylindrical hollow guide member depending from said diaphragm and extending through said barrel portion,
a relief valve seatable across the diaphragm opening and having an operating stem depending through said guide member,
an internal cover member positioned above said relief valve and spaced therefrom,



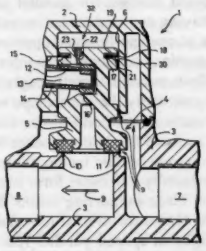
means for operating said relief valve to cause said diaphragm to open from said main valve seat and permit water flow through said flush valve,
and free floating water control means positioned immediately above said relief valve and in between said relief valve and said cover member whereby the height to which the relief valve can rise is reduced and the water flow cycle is shortened.

4,202,526

VALVE

Fritz Müller, D 7118 Ingelfingen-Criesbach, Fed. Rep. of Germany; Jürgen Kenner, and Wolfgang Schädlich, both of Weissbach, Fed. Rep. of Germany, assignors to Fritz Müller, Ingelfingen-Criesbach, Fed. Rep. of Germany

Filed Oct. 4, 1977, Ser. No. 839,184
Claims priority, application Fed. Rep. of Germany, Oct. 9, 1976, 2645802
Int. Cl.² F16K *31/143*
U.S. Cl. 251—51 **18 Claims**



1. A fluid valve comprising a casing having an inlet and an outlet opening separated by a valve seat and defining an internal cylinder in fluid communication therewith, a piston located in said cylinder defining therewith an enclosed space, restricted passage means extending from said enclosed space for draining fluid therefore, and means for moving said piston toward and away from said valve seat whereby one of its ends engages and disengages with said valve seat and its other end simultaneously changing the volume of said enclosed space, the wall of the piston being at least in part spaced from the wall of said cylinder to permit passage of fluid therebetween and a unidirectional seal carried by said piston adjacent its other end and engaging the wall of said cylinder comprising a substantially annular deformable gasket arranged in a groove formed in the wall of said piston, said groove having a first wall furthest from said valve seat and a second wall closest to said

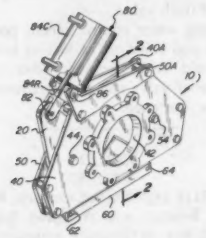
valve seat, said first wall being planar and said second wall being provided with a recess adjacent its outer peripheral edge, said gasket having at least one planar surface conforming to and adjacent said planar wall of said groove and being deformable on movement of said piston toward said valve seat to abut against the first wall of the groove and in cooperation with the wall of said cylinder to seal said cylinder from said inlet and outlet openings and on movement away from said valve seat to abut against the second wall of the groove and in cooperation with the cylinder wall to be deformed into said recess to provide a passage between said cylinder and said gasket for said fluid.

4,202,527

SCISSOR-TYPE VALVE

Frank B. Price, and Mathieu J. Vertenstein, both of Denver, Colo., assignors to Silver Engineering Works, Inc., Denver, Colo.

Filed Nov. 16, 1977, Ser. No. 851,884
Int. Cl.[2] F16K *31/124*
U.S. Cl. 251—58 **8 Claims**



1. In a flow control valve for continuously controlling the size of a stream of fluid containing filterable solids and directing a column thereof into the center of a centrifuge; an upstream blade and a downstream blade mounted one atop the other in superimposed relation for parallel rotational movement, said blades having opposed means movable therewith in scissor-like relation to one another, said opposed means including concave edge portions cooperating in intersecting relation to define a fluid flow passage therethrough, said fluid flow passage remaining essentially the same shape while varying in size upon relative movement of said blades toward and away from one another, and said fluid flow passage being of a shape effective to cause a stream of fluid issuing therefrom to assume and maintain an essentially columnar form irrespective of the size of said passage; blade-supporting means in the form of a plate mounting said blades for pivotal movement about independent axes arranged in spaced parallel relation to one another, said supporting means having an opening therein registering with the flow passage and so sized relative to the latter as to not interfere with the flow therethrough even when fully open; and, blade-actuating means operatively connected to one of said blades link means interconnecting said blades and cooperating with said blade actuating means to effect simultaneously movement thereof so as to maintain the center of the flow passage essentially stationary, said blade-actuating means being located externally of the fluid flow passage in substantially isolated relation to the fluid flow therethrough.

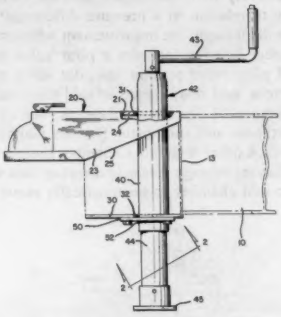
5. The flow control valve as set forth in claim 1 in which: the blade-actuating means comprises a double-acting piston servomotor pivotally connected between the blade-supporting means and one of the blades and wherein said link means comprises a rigid link operatively linking said one blade to the other of said blades for simultaneous movement in opposite directions in response to actuation of said servomotor.

4,202,528

COUPLER AND JACK ASSEMBLY

Alan D. Foster, Adrian, Mich., assignor to Dayton-Walther Corporation, Dayton, Ohio

Filed Mar. 20, 1978, Ser. No. 888,231
Int. Cl.[2] B60S *9/02*
U.S. Cl. 254—86 R **1 Claim**



1. A jack assembly for use with a moble home or the like for connection to the tongue portion of the home, in which the tongue portion is provided with vertically spaced upper and lower plate members each having a jack-receiving opening therein, comprising: a screw type jack having a tubular body, a jack support plate telescoped on said body adjacent a lower end thereof, an underlying annular weld securing said support plate to an outer surface of said body, said body having an upper portion adapted to be received through the openings in said tongue portion with an upper end thereof extending above the upper plate member, and free of any load supporting connection with said upper plate member and with said jack support plate positioned in immediate underlying relation to the adjacent lower surface of the lower plate member, and means for securing said jack support plate to the lower plate member for retaining said jack in place, whereby the entire tongue weight of the mobile home is transferred directly to said jack support plate in compression and to said tubular jack body through said annular weld, in compression.

4,202,529

SMALL VEHICLE LIFT

William L. Fitting, 167 Humboldt, Brisbane, Calif. 94005, assignor to William L. Fitting, Brisbane and David A. Bostrom, Daly City, both of, Calif.

Filed Feb. 1, 1978, Ser. No. 874,142
Int. Cl.[2] B66F *7/12*
U.S. Cl. 254—89 H **5 Claims**

1. A small vehicle lift, comprising:

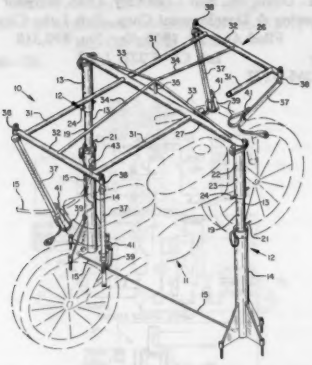
a pair of upright supports, spaced apart to accommodate a small vehicle therebetween, each upright support including an upper portion comprising a piston ram and a lower portion including a fluid actuated cylinder, said upper portion being telescopically received and reciprocable in the lower portion, said upper portions being adapted to be extended upwardly from the lower portions in response to the introduction of fluid pressure into the fluid actuated cylinders;

means for mounting the lower upright support portions on a floor;

frame means connected to both upper support portions, including forward and rearward portions and a cross member directly connecting the tops of the upper support portions, said forward and rearward portions extending forward and rearward generally perpendicularly to the cross member;

means depending from the forward and rearward portions

for connecting to and suspending the vehicle from its front and rear; and



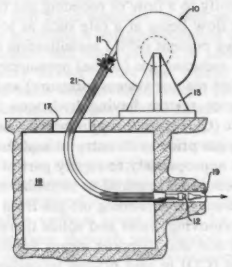
means associated with the telescoping connection between the upper and lower support portions for locking the upper support portions in the upward extended position.

4,202,530

METHOD FOR PULLING CABLE USING A TEAR-AWAY FEEDER TUBE

Allen C. Conti, 5294 E. 117th St., Garfield Heights, Ohio 44125

Filed Dec. 5, 1978, Ser. No. 966,678
Int. Cl.[2] B65H *59/00*
U.S. Cl. 254—134.3 FT **9 Claims**



1. A method for pulling cable by a leading end through a length of conduit, the trailing end of the cable having connector means forming a substantial enlargement to the diameter of the cable, said method including the steps of:

selecting a length of flexible feeder tube having a weakened longitudinal side wall segment thereof,

coupling one end of the feeder tube with one end of the conduit,

pulling the leading end of the cable with a pull-line coupled thereto through the flexible feeder tube and thence along the conduit,

terminating such pulling of the cable before the connector means at the trailing end thereof contact the feeder tube,

removing the feeder tube from the cable by severing the feeder tube along the weakened longitudinal side wall segment, and

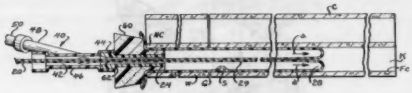
positioning the connector means at the trailing end of the cable into a desired location relative to the conduit.

4,202,531

PNEUMATIC RODDING OF CONDUIT USING EVERTED FLEXIBLE TUBING

James C. Hamrick, Kings Mountain, N.C., assignor to Thomas Industries of Tennessee Inc., Matthews, N.C.

Filed Oct. 2, 1978, Ser. No. 947,531
Int. Cl.[2] A61M *25/00*
U.S. Cl. 254—134.4 **18 Claims**



1. A method of rodding open-ended conduit to facilitate passing of line through the conduit, said method

utilizing tubing of air-tight, imperforate thin-walled plastic film which is non-elastic but sufficiently flexible that the tubing conforms to a shape against which it engages and may be supplied flat and wound in roll form;

the tubing having a circumference no less than that of the conduit interior wall;

and the steps of the method comprising

drawing an end portion of the flat tubing off a supplied roll thereof, collapsing said tubing end portion through the bore of a closure member for the conduit which includes a tapered annular plug of resilient material having an entrant end sized to be snugly received within the near end of the conduit,

then everting said tubing end portion fed through the closure member bore to form an annular pocket forwardly of the closure member which communicates with the bore of the closure member;

inserting the closure member with its annular plug into the near end of the conduit to close said conduit near end and immovably fix said end portion of the tubing in said near end of the conduit; and

blowing air through the bore of the closure member about the collapsed tubing to develope a pressure within the everted tubing end portion sufficient to displace the pocket portion to the far end of the conduit while pulling more tubing into the conduit through the bore of the closure member from the roll supply;

the everted portion of the tubing between its fixed end and the displacing pocket increasing lengthwise in the direction of the far end of the conduit and opening up under the force of the air being blown into the pocket so as to engage and be conformed to the interior wall of the conduit and any impediments such as water or soil present in the conduit,

said impediments and interior wall of the conduit affording shape and backup support to the flexible tubing as it opens in response to developing pressure in the tubing such that the tubing does not burst under the pressure developed in the tubing and forms a continuous air-tight liner extending lengthwise of the conduit to which a line may be attached for drawing through the conduit.

4,202,532

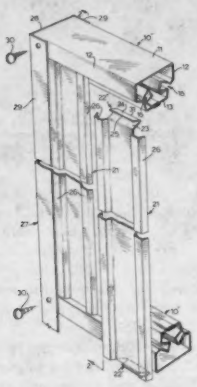
JOINTED STRUCTURE, COMBINATION OF MEMBERS THEREFOR, AND METHOD OF DISASSEMBLY THEREOF

Roy H. Mills, Toronto, Canada, assignor to Westeel-Rosco Limited Westeel-Rosco Limitée, Toronto, Canada

Filed Dec. 23, 1977, Ser. No. 863,863
Claims priority, application Canada, Nov. 22, 1977, 291516
Int. Cl.[2] E04H *17/16*
U.S. Cl. 256—24 **8 Claims**

1. In combination, a first member having a recess bounded by a bottom wall, a first side wall, and a second side wall, and a second member presenting a resiliently deformable V-shaped

lip one limb of which is presented by the second member and the other limb of which has a free edge, the lip being adapted by resilient deformation of said other limb of the lip towards said one limb of the lip to enter the recess in the first member and to attain a position therein in which the lip is in contact



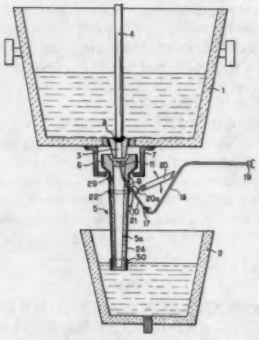
with the bottom wall of the recess with a space provided between said other limb of the lip and the bottom wall of the recess, and with said one limb in bearing contact with the first side wall and the free edge of said other limb in biting engagement with the second side wall at a spaced distance from the bottom wall.

4,202,533

METHOD AND A DEVICE FOR UNCHOKING THE CASTING OUTLET OF A METALLURGICAL VESSEL

Jean-Charles Daussan; Gérard Daussan, both of Metz, and André Daussan, Longeville-les-Metz, all of France, assignors to Daussan et Compagnie, Woippy, France

Filed Oct. 3, 1978, Ser. No. 948,762
Claims priority, application France, Aug. 24, 1978, 78 24555
Int. Cl.[2] B22D *11/10, 32/00*
U.S. Cl. 266—45 **9 Claims**



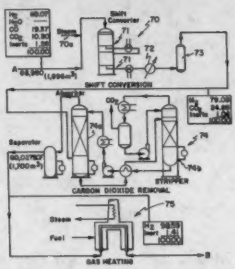
1. A device for unchoking the casting outlet of a metallurgical vessel, said casting outlet being fitted with a vertical casting tube, wherein said device comprises an opening formed in the lateral wall of the casting tube, a feed pipe for supplying oxygen or a suitable gas which is intended to be introduced into the casting tube through the lateral opening aforesaid, means for guiding said feed pipe towards said casting outlet and stopping means for sealing-off the lateral opening aforesaid after said feed pipe is removed.

4,202,534

METHOD AND APPARATUS FOR PRODUCING METALLIZED IRON ORE

William L. Davis, Jr., Salt Lake City, Utah, assignor to HICAP Engineering & Development Corp., Salt Lake City, Utah

Filed Apr. 24, 1978, Ser. No. 899,318
Int. Cl.[2] C22B *1/10*
U.S. Cl. 266—172 **34 Claims**



1. Direct reduction apparatus operating under pressure producing metallized iron ore from selected feed stock comprising,

iron ore heater means for providing controlled heating of a select size of iron ore therein to dry that ore and to raise the temperature thereof sufficiently to supply thereto part of the endothermic heat of reduction required to metallize said ore in a downstream reactor;

means for pressuring to the pressure of a first pressurized fluidized bed ore reactor system said dried and heated iron ore and moving said dried and heated iron ore;

a first pressurized fluidized bed ore reactor system arranged to receive said dried and heated ore and consisting of a housing wherein is arranged an ore bed that moves counter-currently to a flow of reducing gas therethrough, that opposite flow being at a rate such as to produce up to a ninety-five percent (95%) metallization of that ore;

(a flow of) reducing gas (at the) pressurized to the pressure of said first reactor system (pressure) and passed into said first reactor system having hydrogen (H_2) and carbon monoxide (CO) gases as major constituents thereof, which reducing gas prior to its entry to said first reactor system is heated appropriately to supply part of the endothermic heat of reduction required to metallize iron ore;

scrubber means for scrubbing off-gas from said first reactor system, removing water and solids therefrom;

shift conversion and stripping means for converting carbon monoxide (CO) in said off-gas to carbon dioxide (CO_2) and for removing carbon dioxide (CO_2) therefrom leaving hydrogen gas (H_2) and inerts only;

means for heating said hydrogen gas (H_2) and inerts to supply thereto part of the endothermic heat of reduction required to metallize iron ore;

a second pressurized fluidized bed ore reactor system like the described first reactor system metallizing, to the same percentage a bed of iron ore therein that is constructed like the bed of the first reactor system, and is arranged to receive and pass counter-currently to the moving ore therein, inlet pressure of said second reactor system being that of said converted, stripped and heated off-gas producing thereby metallized iron ore as a product therefrom;

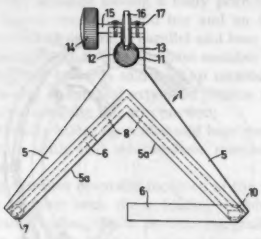
scrubber means arranged to receive off-gas from said second reactor system for scrubbing that off-gas to remove water and solids therefrom; and

means for beneficially using said scrubbed off-gas from said second reactor system.

4,202,535
CONTROL DEVICE FOR CUTTING TORCH

Allan Eriksson, Fack 108, Malå, Sweden (S-930 70)

Filed Nov. 16, 1977, Ser. No. 852,007
Claims priority, application Sweden, Nov. 16, 1976, 7612787
Int. Cl.² B23K 7/10
U.S. Cl. 266—56 7 Claims



1. A guide assembly for controlling the movement of a cutting torch relative to a workpiece positioned adjacent thereto, and comprising:

a stand assembly releasably attached to said workpiece and including a first end portion formed by a pair of substantially rectangularly-shaped leg members extending along and confronting opposite side portions of said workpiece, with said leg members including confronting end portions engaging one another and further engaging a second end portion extending substantially away from said workpiece, with said second end portion including an aperture extending longitudinally therethrough;

said leg members each including a groove formed in a surface portion confronting said workpiece, with a separate magnet assembly pivotally attached to each leg member and positionable within a respective groove formed in each leg member, wherein each magnet assembly forms a magnetic connection between confronting surface portions of said workpiece and one of the grooves for releasably attaching said stand assembly to said workpiece;

a beam assembly including a portion extending through said aperture to support said beam relative to said workpiece;

a support assembly having a first part rigidly engaging a portion of said beam and having a second part supported on said first part and rotatably about an axis of symmetry extending through said support assembly;

link means for engagably supporting said cutting torch in a position adjacent to said workpiece;

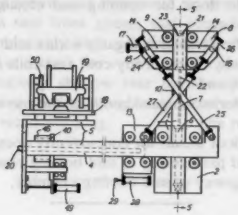
angle setting guide means mounted on said second part of said support assembly for selectively rotating said link means through a vertical plane formed by said axis of symmetry extending through said support assembly, to position said cutting torch at a predetermined angle relative to said workpiece.

4,202,536
AUTOMATED INSTALLATION FOR PUNCHING AND CLEANING OF CONVERTER TUYERES

Lech Demidowicz, Maja, and Mieczyslaw Sztuka, Jagiellonska, both of Poland, assignors to Kombinat Gorniczo-Hutniczy Miedzihuta Miedzi "Legnica", Legnica, Poland

Filed Jun. 5, 1978, Ser. No. 912,297
Claims priority, application Poland, Jun. 7, 1977, 198745
Int. Cl.² F27D 23/02
U.S. Cl. 266—135 12 Claims

1. An automated apparatus for punching and cleaning the converter tuyeres to be used particularly in non-ferrous pyrometallurgy, said apparatus being provided with a travel unit mounted to a converter housing enabling displacement of a punching unit with respect to the tuyeres and punching of the tuyeres at converter means, said punching unit employing an axially shiftable punching rod mounted in a supporting guide for introducing the working end of the rod into the tuyeres, the opposite end of the punching rod mounted, being in a car, said car being mounted on a rail and being movable along said rail by means of a driving unit, said driving unit including: at least one power cylinder situated transversely relative to the axis of the rail, provided with a piston rod and on the extended end of

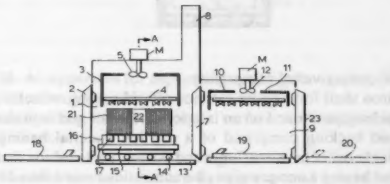


said piston rod there being mounted a carriage, upon which at least one pair of pull rods is mounted, one of these pull rods being coupled in an articulated fashion with the rail on the side of the above mentioned power cylinder opposite to said punching unit, and the other pull rod being coupled with the car of the punching unit, wherein the punching rod is mounted.

4,202,537
APPARATUS FOR ANNEALING STRIP COILS

Yoshiaki Kawasoko, Chigasaki; Iwane Chiba, Soka; Noboru Yamazaki; Toshimi Chiyonobu, both of Fukuyama, and Masao Shikuma, Kamakura, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 753,907, Dec. 23, 1976, abandoned. This application May 12, 1978, Ser. No. 905,547
Claims priority, application Japan, Dec. 25, 1975, 50-153930
Int. Cl.² C21D 9/00
U.S. Cl. 266—252 4 Claims



1. Apparatus for annealing strip coils, comprising

A. a single heating chamber comprising

i. an inner cover,

ii. means for circulating heated gases within said heating chamber,

iii. a first passageway located at one end of said heating chamber,

iv. a movable door for opening and closing said first passageway,

v. a second passageway located at an end opposite to said first end for moving said coils out of said heating chamber,

vi. means for raising the temperature in said heating chamber to thereby heat the gases therein and uniformly heat said coils in said heating chamber, and

vii. means for moving said coils to be anealed in and out of said heating chamber;

B. a single chamber located adjacent to said heating chamber comprising

i. an inner cover,

ii. means for circulating cooled gases within said cooling chamber,

iii. a first passageway disposed connected to said second passageway of said heating chamber for moving said heated coils into said cooling chamber from said heating chamber,

iv. a second passageway located at an end opposite to said first passageway for moving cooled coils out of said cooling chamber,

v. movable door for opening and closing said second passageway,

vi. means for cooling said gases within said cooling chamber thereby to uniformly cool said coils in said cooling chamber, and

vii means for moving said coils in and out of said cooling chamber; and

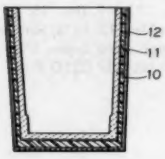
C. movable door means for concurrently opening or closing said second passageway of said heating chamber and said first passageway of said cooling chamber.

4,202,538

CASTING VESSEL HAVING BASIC LINING AND USAGE THEREOF

Noburo Shimada, Tokyo; Akira Miyamoto, Kawasaki; Motonobu Kobayashi, Yokohama; Akio Kuribayashi, Tokyo; Takeharu Toyoda, Yokohama; Morihiro Kimura, Tokyo; Hiroshi Kyoden, Okayama; Toshisuke Hoshino, and Jiro Watanabe, both of Bizen, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 2, 1978, Ser. No. 882,818
Claims priority, application Japan, Mar. 2, 1977, 52-21470
Int. Cl.[2] C21B *9/06*
U.S. Cl. 266—275 **7 Claims**



1. A casting vessel comprising:

an iron shell forming an exterior of said casting vessel;

a backing positioned on an interior surface of said iron shell, said backing comprised of a cushion material having a thickness of between 7 mm and 50 mm, said cushion material having a compressive characteristic of more than 10% for a pressure of 10 kg/cm^2;

a basic lining positioned on said backing, said basic lining having a thickness of between 70 mm and 300 mm, said casting vessel being constructed such that the thickness of said backing is not more than 50% of the thickness of said basic lining.

4,202,539

ENGINE WORK STAND

Robert S. Polastri, Branford, and Harry L. Ruzicka, Jr., Easton, both of Conn., assignors to Avco Corporation, Stratford, Conn.

Filed Nov. 15, 1978, Ser. No. 960,910
Int. Cl.[2] B23Q *1/04*
U.S. Cl. 269—70 **3 Claims**

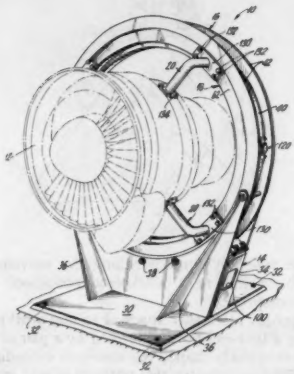
1. A build stand for rotatably mounting an engine thereon comprising:

a base;

an outer structural ring fixed to and supported by the base, in a substantially vertical plane, said ring being constructed of a rolled channel member, having a U-shaped cross section including base portion and arm portions;

bearing means secured to the outer ring and disposed on the radially inward surface of said outer ring;

an inner structural ring concentrically mounted within the outer ring for rotation on said bearings, said ring being constructed of a rolled channel member having a U-shaped cross section including a base portion and arm portions, said base portion positioned radially inward of said arm portion;



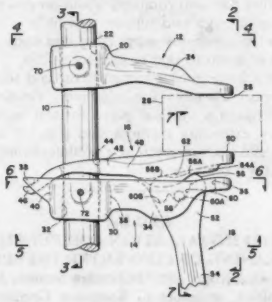
a plurality of axially extending support arms fixed to said inner ring and having means to receive and secure the engine in a generally horizontal disposition such that its longitudinal axis is generally aligned with the longitudinal axis of the concentric rings, and the center of gravity of the engine is disposed substantially within the plane of said rings.

4,202,540

BAR-TYPE CLAMP

Lawrence M. Neff, 10031 E. 52nd St., Tulsa, Okla. 74145

Filed Oct. 30, 1978, Ser. No. 956,197
Int. Cl.[2] B25B *1/02*
U.S. Cl. 269—166 **9 Claims**



1. A clamp comprising:

an elongated bar;

a backup member having a body portion with an opening therein receiving said bar, and an arm integrally extending from the body into a plane generally perpendicular to the axis of the opening in the body portion, the dimension of the opening being such that force exerted adjacent the outer end of the arm portion engages the body portion with said bar in non-sliding relationship;

a base member having a body portion with an opening

therein slidably receiving said bar, and having an arm portion integrally extending from the body in a plane generally perpendicular to the axis of the opening in the body portion, the dimension of the opening being such that force exerted adjacent the outer end of the arm portion engages the body portion with said bar in non-sliding relationship, an integral extension portion extending from the body portion in the direction opposite the arm portion;

an intermediate member having a body portion having an opening therein receiving said bar and an integral arm portion extending generally parallel said base portion arm and displaceable relative to said base member arm portion in the direction towards said backup member, the body portion having an integral extension portion extending in the direction opposite the arm portion;

means of pivotally interconnecting said base member extension portion with said intermediate member extension portion; and

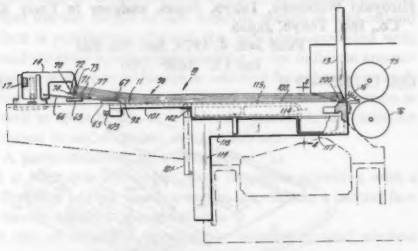
an actuating member pivotally received at the outer end of said base member arm, the actuating member having a body portion and a handle portion integrally extending therefrom, the body portion having a cam surface engaging said intermediate member arm, whereby an object to be clamped may be positioned between said backup member arm portion and said intermediate member arm portion, and the handle of the actuating member pivoted to cause the cam surface to push said intermediate member away from said base member arm portion to forcibly engage an object positioned between said backup member arm and said intermediate member.

4,202,541

SUCTION FEED TABLE

Alexander Leskiw, Whitestone, and Seth Graubert, Rockville Centre, both of N.Y., assignors to S & S Corrugated Paper Machinery Co., Inc., Brooklyn, N.Y.

Filed May 31, 1978, Ser. No. 911,184
Int. Cl.[2] B65H *3/64*
U.S. Cl. 271—132 **6 Claims**



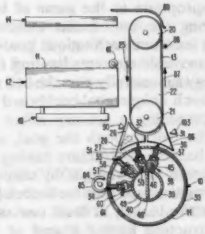
1. In equipment for successively feeding the bottom sheet from a stack of sheets along a generally horizontal feed path to additional apparatus positioned forward of said equipment; first means defining a generally horizontal support for said stack; guide means for maintaining the stack in position transverse to said path, rear gauge means at the rear of said stack, front gauge means positioned above said support to define a space between the lower end of said front gauge means and said support equal to slightly more than the thickness of one sheet and less than the thickness of two sheets, a carriage, means for recreciprocating said carriage parallel to said feed path, a mechanical feeder carried by said carriage, said mechanical feeder including feeder means operatively positioned at the rear of said stack when said carriage is in its most rearward position and operatively disposed to engage the trailing edge of said bottom sheet and drive the latter forward as said carriage moves forward from said most rearward position, second means for applying a suction assist force to draw the bottom of the stack downward; said suction assist force acting at said front gauge and for a substantial distance to the rear thereof; said second means for applying a suction assist force including a first portion acting from said front gauge rearward to a second portion of said second means; said first portion being derived from relatively high velocity air flow moving along the bottom of said stack rearward from the front gauge through a relatively shallow front portion of a chamber means; said chamber means constituting a portion of said second means disposed below said horizontal support and extending rearward from said front gauge; said second portion being derived from relatively high velocity air flow moving along the bottom of said stack forward from the rear of said stack through a relatively shallow rear portion of said chamber means; said front portion being relatively short and said rear portion being relatively long.

4,202,542

APPARATUS FOR HANDLING FLEXIBLE SHEET MATERIAL OF DIFFERENT SIZES

Gerald B. Lammers, and Robert T. Ritchie, both of Boulder, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 1, 1977, Ser. No. 856,552
Int. Cl.[2] B65H *5/12*
U.S. Cl. 271—276 **22 Claims**



18. An apparatus for supporting rectangular shaped, flexible sheets of various sizes thereon including:

transporting means having a surface for transporting the sheet;

a first vacuum chamber having a first controlled vacuum;

a second vaccum chamber having a second controlled vacuum;

first connecting means to continuously connect said first vacuum chamber to a first area of said surface of said transporting means for attaching the leading portion of the sheet to said surface of said transporting means;

first control means to selectively control the portion of the first area of said surface of said transporting means to which the first controlled vacuum from said first vacuum chamber is applied through said first connecting means in accordance with one of the dimensions of the sheet;

second connecting means to continuously connect said second vacuum chamber to at least one other area of said surface of said transporting means spaced from the first area of said surface of said transporting means in the direction of the other of the dimensions of the sheet;

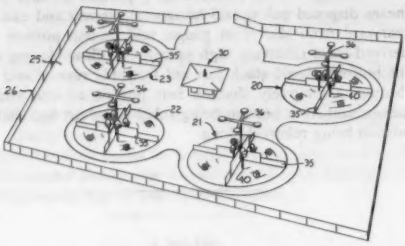
and second control means to selectively control the portion of the other area of said surface of said transporting means to which the second controlled vacuum from said second vacuum chamber is applied through said second connecting means for attaching the trailing portion of the sheet to said surface of said transporting means in accordance with at least the one dimension of the sheet.

4,202,543

RECREATIONAL BASKETBALL COURT FACILITY

Andrew P. Collins, 3926 Dover, Durham, N.C. 27705

Filed Sep. 1, 1977, Ser. No. 829,987
Int. Cl.[2] A63J 3/00; A63B 63/00
U.S. Cl. 272—3 1 Claim



1. A commercial basketball recreational facility comprising:
(a) An array of basketball courts grouped in spaced-apart sets on a common land area, each set of courts having a plural number of courts and each court having a goal-backboard support means and appropriate fencing shared with adjacent courts on either side thereof; and
(b) a set of elevated unique goal-backboard structures for the array of courts with one such unique structure being supported in each court on each said support means at an elevation appropriate to the game of basketball and including among the set of said unique goal-backboard structures at least one such unique goal-backboard structure having movable elements limiting the time in which the player may successfully pass the ball through the goal, at least one such unique goal-backboard structure having means for providing a sensory effect upon successful passage of the ball through the goal, at least one such unique goal-backboard structure having a barrier affixed to the backboard and arranged by shape and position to require a particular type shot for successful passage of the ball through the basket, at least one such unique goal-backboard structure having a goal of unique shape as compared to goals of other said goal-backboard structures and at least one such unique goal-backboard structure having means to rotate selected portions of such unique goal-backboard structure about a selected fixed axis so as to make successful passage of the ball through the goal associated therewith dependent on the rotative position of such selected portions.

4,202,544

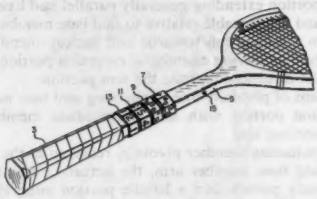
TENNIS SCOREKEEPING DEVICE AND METHOD OF USING

Jewett E. Popma, 100 SW Leonard St., Lake Oswego, Oreg. 97034

Filed Nov. 18, 1977, Ser. No. 852,796
Int. Cl.[2] A63B 49/00
U.S. Cl. 273—73 R 2 Claims

1. In combination, a game playing instrument having an elongate handle and a game score indicator on the handle wherein the improvement comprises:
a plurality of separate player identifying stretchable bands, at least partly elastic, and removeably mounted by compression of the elastic on the instrument's handle;
the bands including means for indicating scores of at least two separate players simultaneously;
reference means on the playing instrument for aligning the bands therewith to indicate the score of the game;
and separate means on the handle for indicating the games won and lost by each player.

2. The method of keeping the game score of two players on the throat of a playing instrument having thereon a plurality of expansable and compressible elastic bands, each of the bands having thereon a plurality of score indicators including an indicator for the score zero, and a band reference indicator fixed to the playing instrument, comprising the steps of:
(A) slipping the bands over the throat of the playing instrument;
(B) aligning the zero indicator on each of the bands on the throat with the band reference indicator;
(C) expanding the band after a score is made;



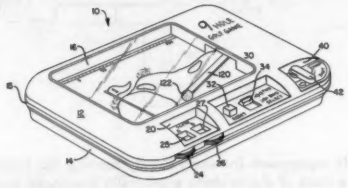
(D) rotating the band relative to the band reference indicator;
(E) aligning a score indicator on the rotating band with a score indicator on the non-rotating band simultaneous with alignment of the score indicator on the rotated band with the band reference indicator;
(F) compressing the rotated band on the throat.

4,202,545

GOLF GAME DEVICE

Hiroyuki Watanabe, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan

Filed Jan. 4, 1979, Ser. No. 920
Int. Cl.[2] A63F 7/06
U.S. Cl. 273—87 R 11 Claims



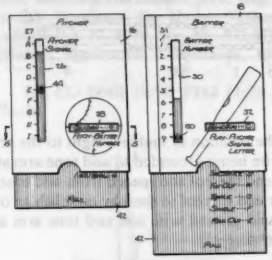
1. A golf game device comprising:
a support structure;
a program tape mounted for movement traversely across said support structure and having depicted thereon various golf game scenes including green tee off spots, green scoring holes, and traps of various types;
actuating mechanism for moving said program tape;
a replica of a golf ball mounted for movement across the path of said program tape;
trigger mechanism associated with the golf ball replica and operable by a player of the game device for effecting the movement of said golf ball replica across the tape path;
an indicator means associated with the program tape for signalling a score as simulated by the positioning of the golf ball replica over a green scoring hole on said program tape.

4,202,546

GAME

Howard M. Bromberg, Bronx, N.Y., assignor to The Flexi Group, Inc., New York, N.Y.

Filed Jul. 5, 1978, Ser. No. 921,891
Int. Cl.[2] A63F 9/00
U.S. Cl. 273—93 R 16 Claims



1. A game comprising:
(a) an envelope provided with a first face having window means therein and a second face having window means therein;
(b) sets of indicia in cooperative relation to said window means on said first and second faces;
(c) a support means mounted within said envelope provided with sets of indicia including marker means visible within said window means on said first and second faces;
(d) said support means moveable to one position wherein said marker means appears in said window means in said first face adjacent an indicium associated with said window means to reveal an indicium in said window means in said first face; and
(e) said support means moveable to another position wherein said marker means in said window means in said second face is positioned adjacent the indicium associated with said window means corresponding to the indicium appearing in said window means in said first face thereby revealing in said window means in said second face an action as well as an indicium to which said marker in said window means in said first face is to be moved.

9. A game including, in combination:
(a) at least two envelopes, each envelope provided with a first face having window means therein and a second face having window means therein;
(b) sets of indicia in cooperative relation to said window means on said first and second faces;
(c) a support means mounted within each of said envelopes provided with sets of indicia visible within said window means in said first and second faces;
(d) said support means moveable within one of said envelopes to one position wherein said marker means appears in said window means in said first face adjacent an indicium associated with said window means to reveal an indicium in said window means in said first face; and
(e) said support means moveable within another of said envelopes to a position wherein said marker means in said window means in said second face of said another envelope is positioned adjacent the indicium on said another envelope associated with said window means corresponding to the indicium appearing in said window means in said first face of said one envelope thereby revealing in said window means in said second face of said another envelope an action as well as an indicium to which said marker in said window means in said first face of said one envelope is to be moved.

4,202,547

MOVABLE GOLF GREEN APPARATUS

Thomas L. Mueller, 1018 Price Rd., Tempe, Ariz. 85281

Continuation-in-part of Ser. No. 815,936, Jul. 15, 1977, abandoned. This application Nov. 9, 1978, Ser. No. 959,336
Int. Cl.[2] A63B 69/36
U.S. Cl. 273—181 A 25 Claims

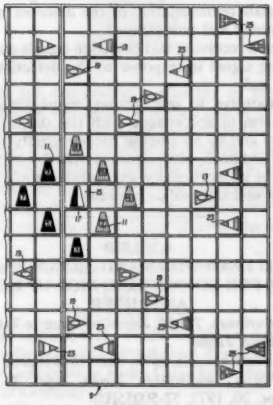
16. Movable golf green apparatus for providing a variety of distances and orientations of a golf green to a user, comprising, in combination:
golf green means;
wheel means secured to the golf green means;
motor means for moving the wheel means and the golf green means; and
control means for actuating the motor means to move the wheel means and the golf green means over a variety of distances and for rotating the golf green means for providing a variety of orientations of the golf green apparatus to a user.

4,202,548

INTERNATIONAL CODE FLAG EDUCATIONAL GAME

M. Robert Reitz, P.O. Box 1543, Annapolis, Md. 21404

Filed Jun. 30, 1978, Ser. No. 920,982
Int. Cl.[2] A63F 3/00
U.S. Cl. 273—272 3 Claims



1. An educational game apparatus for teaching International Code Flags comprising:
(a) a plurality of tiles, each tile having an International Code Flag insignia on a surface thereof, said plurality of tiles containing substantially all letters of the alphabet and wherein each tile has a predetermined score value determined by the number of different colors thereon;

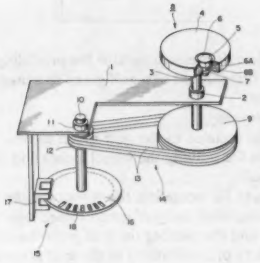
(b) a game board having means for dividing the board into a plurality of areas on which the tiles are placed to form words,
(c) said game board includes areas having supplemental values in the form of both International Code Flag number pennants and numbered nautical buoys thereon;
(d) wherein the tiles are played by one or more persons to form words.

4,202,549

DEVICE FOR MANUALLY CONTROLLING MOVEMENT OF PICKUP ARM IN AUTOMATIC RECORD PLAYER

Atsushi Takeuchi, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Sep. 18, 1978, Ser. No. 943,644
Claims priority, application Japan, Sep. 22, 1977, 52-114387; Sep. 22, 1977, 52-128155[U]
Int. Cl.² G11B *3/00*
U.S. Cl. 274—9 RA **12 Claims**



1. A device for manually controlling movement of a pickup arm in an automatic record player, comprising:
manually operative manipulation means selectively movable in opposite directions;
means for transmitting movement of said manipulation means;
means for detecting the amount and direction of the movement of said manipulation means transmitted by said movement transmitting means and for generating detection signals representative of the detected movement in both amount and direction;
circuit means receiving said detection signals and generating a driving signal in response to the detection signals received; and
means responsive to said driving signal for driving said pickup arm in accordance with this driving signal in a direction and by an amount proportionally to the movement of said manipulation means whereby said pickup arm will move proportionally and follow faithfully all movements of said manipulation means.

4,202,550

STEREO LEAD WIRES AND ARRANGEMENTS THEREOF FOR CONNECTING PICK-UP DEVICE TO AMPLIFIER

Mitsuyoshi Morinaga, Tokyo, Japan, assignor to Trio Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 13, 1978, Ser. No. 896,040
Claims priority, application Japan, Apr. 20, 1977, 52-50054[U]; Apr. 20, 1977, 52-50055[U]
Int. Cl.² G11B *3/10*
U.S. Cl. 274—23 R **6 Claims**

1. Improved lead wires for use with a stereo record playback system where at least a pair of left channel wires and at least a pair of right channel wires extend from a connector for pick-up device through an electrically conductive tone arm to a stereo amplifier, said lead wires comprising
a ground wire and said left and right channel wires, said ground wire being disposed between said left channel wires and said right channel wires to provide electrical isolation therebetween, said ground wire and left and right channel wires being bonded together at least in a portion of said tone arm as a single unit so that said electrical isolation is implemented at least within said tone arm

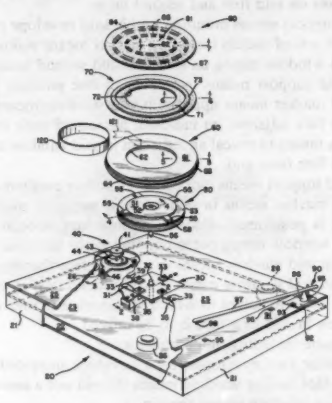
without the addition of undue weight to the arm and said ground wire being grounded to said tone arm at the stereo amplifier end thereof and spaced from said tone arm at the connector end thereof to thereby establish an open circuit between said ground wire and said tone arm at said connector end thereof.

4,202,551

ACOUSTIC DAMPENING ASSEMBLY FOR RECORD PLAYER TURNTABLE

Tom A. Darnall, Jr., Buckhannon, W. Va. 26201

Filed May 11, 1978, Ser. No. 904,788
Int. Cl.² G11B *3/60*
U.S. Cl. 274—39 R **26 Claims**



11. In a turntable having a base, a mounting support plate, a platter support plate, a two-stage platter assembly comprising an inner platter and an outer platter, and a spindle, the improvement comprising an acoustic dampening assembly for isolating, blocking, and decoupling all collision course vibrations and for preventing synergistic combinations thereof, said acoustic dampening assembly comprising, in combination:
A. a mat assembly, comprising at least one mat which prevents air from entering between said at least one mat and a flexible record placed thereupon;
B. a plurality of decoupling devices which comprise:
(1) at least one layer of energy absorbing material on resonant-prone surfaces that are exposed to outside vibrations, said resonant-prone surfaces comprising bottom and top surfaces of said upper platter and top surfaces of said lower platter,
(2) circumannular compressors, tensionally attached to peripheral surfaces of said inner platter and said outer platter, which absorb and dampen any vibrations and resonances that are absorbed or picked up by said platter assembly, and

(3) sandwich cushions between said inner platter and said outer platter; and

C. a stub-like spindle as said spindle, having a top which is below the upper surface of said outer platter.

4,202,552

HEAT SHIELD AND APPARATUS COMPRISING SAME

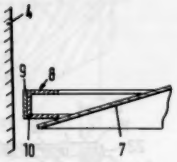
Gilles G. Hirs, Bensberg-Herkenrath, Fed. Rep. of Germany, assignor to B.V. Neratoom, The Hague, Netherlands

Filed Jan. 27, 1978, Ser. No. 872,878

Claims priority, application Netherlands, Feb. 11, 1977, 7701481

Int. Cl.² F04B *39/00*; F16J *15/54*

U.S. Cl. 277—26 **2 Claims**



1. A heat shield for mounting in closely-spaced relation to a circumscribing wall, the heat shield comprising a frusto-conical plate having a circular circumference and two concentric annular parts having different coefficients of thermal expansion, the parts being united to form a unitary element of which one part, having the lower coefficient of expansion, is arranged outside the other part so that decreased spacing between the heat shield and a circumscribing wall can be achieved during operation at elevated temperature, said two annular parts being formed as a bimetallic ring placed on said plate, said ring being cut through in one position.

4,202,553

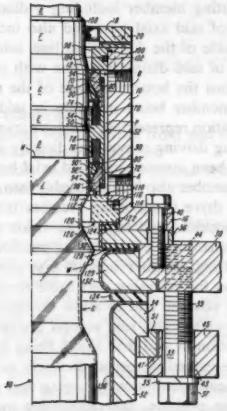
SEAL CARTRIDGE FOR AGITATOR SHAFT OF A CHEMICAL REACTOR

Donald E. Kropp, Ft. Thomas, Ky., assignor to Ceramic Coating Company, Newport, Ky.

Filed Nov. 3, 1978, Ser. No. 957,529

Int. Cl.² F16J *15/34*

U.S. Cl. 277—41 **22 Claims**



1. A removable seal cartridge assembly for the upper end adjacent portion of an agitator shaft which projects outwardly from the drive nozzle of a chemical reactor vessel, which comprises:

(a) an agitator shaft;

(b) a drive means movable between a first position in axial alignment with said agitator shaft and a second position which provides free unobstructed access to the upper end of the agitator shaft;

(c) means for selectively and releasably interconnecting the agitator shaft in driven relationship with said drive means;

(d) an elongated housing releasably secured to a reactor vessel and having upper and lower ends with an axial bore therethrough, said agitator shaft extending through said bore into said reactor vessel with said housing being positioned below said releasably interconnecting means;

(e) an elongated cylindrical seal cage in said housing, said seal cage having inner and outer surfaces and upper and lower ends wherein the outer surfaces are disposed in laterally spaced relationship with respect to the inner surface of the housing and wherein the inner surface of the cage provides a slip fit with respect to the outer surface of the agitator shaft;

(f) means releasably anchoring said seal cage to the agitator shaft for rotation therewith; and

(g) means in said housing for supporting said seal cage for common removal with said housing whenever said housing is moved axially upward to the space occupied by said drive means in said first position subsequent to moving said drive means to said second position.

4,202,554

BRUSH SEALS

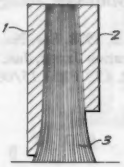
Leonard S. Snell, Bristol, England, assignor to Rolls-Royce Limited, London, England

Filed May 16, 1979, Ser. No. 39,605

Claims priority, application United Kingdom, May 17, 1978, 20230/78

Int. Cl.² F16J *15/44*

U.S. Cl. 277—53 **4 Claims**



1. A brush seal comprising a plurality of tightly-packed bristles sandwiched in a space between a pair of axially-spaced annular side-plates and having free ends projecting in the plane of the seal from a circumferential edge of the side-plate pair, the bristles and the space between the side-plates being dimensioned in relation to each other so that the cross-sectional area of bristle material at any radius substantially completely fills the cross-sectional area of the space between the side-plates at that radius.

4,202,555

SEALING RING

Bernd Becker, Leimen; Hans Forch, Birkenau; Adam Helfrich, Wald-Michelbach, and Gottfried Jung, Fürth, all of Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim, Fed. Rep. of Germany

Filed Feb. 12, 1979, Ser. No. 11,467

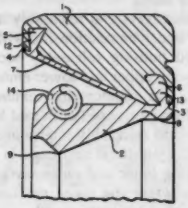
Claims priority, application Fed. Rep. of Germany, Feb. 18, 1978, 2807022

Int. Cl.² F16J *15/32*

U.S. Cl. 277—153 **11 Claims**

1. A sealing ring comprising a reinforcing ring composed of thermoplastic material having at least one annular groove therein; and a lip ring concentrically nested in the reinforcing

ring and having a circular bead for each annular groove having the same profile and set therein, wherein each bead has a profile which in the projecting portion is enlarged in the manner of a wedge extending essentially radially outwardly, the nominal diameter on which each bead is disposed being smaller than the nominal diameter of the associated groove.



4,202,556

SEALING MEANS

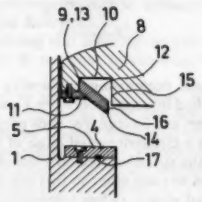
Mamoru Makishima, Aichi, and Koyu Yamasaki, Obu, both of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Japan

Filed Jun. 5, 1978, Ser. No. 912,214

Claims priority, application Japan, Jun. 10, 1977, 52-74860[U]

Int. Cl.[2] F16J *15/08*

U.S. Cl. 277—190 **9 Claims**



1. A sealing structure comprising: first and second rigid members spaced apart and comprising first and second surfaces, respectively, facing each other, said first surface on said first member being planar; a gasket formed as a closed ring with an outer perimeter generally axially displaced from an inner perimeter, whereby said gasket has a truncated, tapered shape and comprises first and second axially displaced sealing ends, each of said ends comprising a sharp edge formed as a closed loop in a plane substantially at each of said first and second sealing ends, respectively, said second surface on said second member comprising a groove facing said first member, said first end of said gasket being held in said groove; and a wall extending generally axially adjacent said second sealing end to receive an end region of said second sealing end when said first and second members are pressed against said ends of said gasket.

4,202,557

DRILLING DEVICE

August Haussmann, Oberzell; Siegfried Klaissle, Linsenberg; Hermann Hugger; Bernhard Moser, both of Altshausen; Walter Müller, Weingarten; Wolfgang Peetz, Blitzenreute, Biegenburg; Anton Scheuch, Ravensburg, and Gerhard Schwarz, Blitzenreute, all of Fed. Rep. of Germany, assignors to Hawera Probst GmbH & Co., Ravensburg, Fed. Rep. of Germany

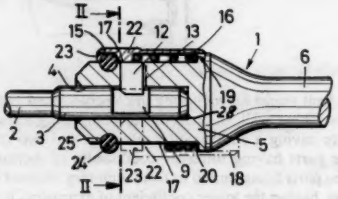
Continuation of Ser. No. 797,504, May 16, 1977, abandoned.

This application Nov. 13, 1978, Ser. No. 959,525

Claims priority, application Fed. Rep. of Germany, May 15, 1976, 2621809

Int. Cl.[2] B23B *31/06, 31/10*

U.S. Cl. 279—19.5 **14 Claims**



1. A drilling device for a drill which includes in combination: a driving head drivingly connectable to a drilling machine and having an axial bore for detachably receiving a drill shank, said driving head also having a transverse bore leading from the periphery of said driving head into said axial bore, a dual function drive transmitting member said drill having said drill shank thereof insertable into said driving head and provided with a continuous recess having a segment-shaped cross section and a bottom surface convex in radial section relative to the drill axis and in a radial cross section having a chord form for engagement with said drive transmitting member, said drive transmitting member including a diametrical line of a cross section of said axial bore and also including a stepped edge on one side of the diametrical line, said recess being on said one side of said diametrical line with said stepped edge engaging against the bottom surface of the recess, said drive transmitting member being movable in said transverse bore into a first position representing the drive transmitting position for transmitting driving movement directly onto a drill when such drill has been inserted into said axial bore and said drive transmitting member also being movable into a second position in which said drive transmitting member is out of said drive transmitting position, and adjustable means movable on said driving head selectively into a locking position for locking said drive transmitting member in said first position and into a release position for releasing said drive transmitting member out of its first position and to allow movement of said drive transmitting member into said second position, said recess in the axial direction of said drill shank being limited by at least one cross face extending perpendicularly to the axis of said drill; spring means continuously urging said adjustable means into its locking position, said adjustable means including a sleeve surrounding said driving head, and said spring means being a coil spring arranged between said sleeve and said driving head, said coil spring being coaxial with said sleeve and said drive head.

4,202,558

SUPPORT BODY FOR ROLLERS OF SKATING DEVICES

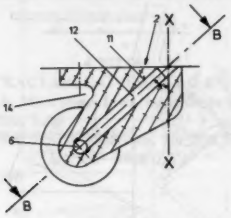
Armin Olschewski, Schweinfurt; Manfred Brandenstein, Aschfeld; Manfred Krug, Schweinfurt, and Horst Martin, Gochsheim, all of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Feb. 21, 1978, Ser. No. 879,742

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1977, 7709615

Int. Cl.² A63C *17/02*

U.S. Cl. 280—11.28 **13 Claims**



1. A support member for each roller shaft of a skating device which includes a mounting plate and two of said roller shafts and rollers thereon, each of said support members being formed of plastic material and comprising an upper part securable to said mounting plate, a lower part to which is secured one of said roller shafts, and a pin which has one end rigidly joined to said roller shaft, extends through said support member between said upper and lower parts, and is stiffer than said support member, said support member comprising an injection molded member in which said joined pin and roller shaft are molded.

4,202,559

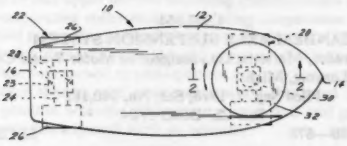
SKATEBOARD

John Piazza, Jr., 53 Bertha Pl., Staten Island, N.Y. 10301

Filed Aug. 10, 1978, Ser. No. 932,428

Int. Cl.² B62B *11/00*

U.S. Cl. 280—87.04 R **12 Claims**



1. A skateboard comprising:
(A) a rigid elongated board having front and rear portions;
(B) first and second wheel assemblies;
(C) means for fixedly mounting said second wheel assembly below said second portion;
(D) a steering platform;
(E) means, secured to said first portion, linking said platform above said first portion and said first wheel assembly below said first portion for pivotal movement as a unit relative to said board;
(F) means for limiting the angle through which said platform/first wheel assembly unit is pivotable; and
(G) means for biasing said platform/first wheel assembly unit to a given orientation;
said first portion defining an aperture extending vertically therethrough, and said linking means, said limiting means, and said biasing means constituting a single unit substantially completely disposed within said aperture, said single unit comprising a bearing collar fixedly mounted in said aperture and having an aperture extending through the sidewall thereof, a hollow bearing coaxially extending through said collar and having a transversely extending slot in the sidewall thereof, and a spiral spring coaxially disposed substantially within said bearing, the upper surface of said bearing and one end portion of said spring being operatively secured to said platform for pivotal movement therewith, the bottom surface of said bearing being operatively secured to said first wheel assembly for pivotal movement therewith, and the other end portion of said spring extending through said bearing slot and said collar aperture and being operatively secured to said board to preclude lateral movement thereof.

4,202,560

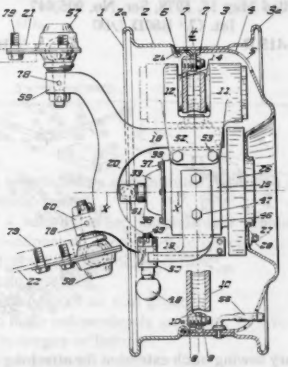
SPEEDOMETER DRIVE GEAR ASSEMBLY FOR A CENTERLINE STEERING WHEEL ASSEMBLY

Melvin R. Inbody, Findlay, Ohio, assignor to The Centerline Steering Safety Axle Corporation, Findlay, Ohio

Division of Ser. No. 836,673, Sep. 26, 1977, Pat. No. 4,159,832, which is a continuation of Ser. No. 638,069, Dec. 5, 1975, abandoned, which is a continuation-in-part of Ser. No. 492,438, Jul. 29, 1974, Pat. No. 3,963,260. This application Oct. 10, 1978, Ser. No. 949,683

Int. Cl.² G01P *3/02*

U.S. Cl. 280—96.3 **5 Claims**



1. A speedometer drive gear assembly for a surface vehicle having a hub, means for supporting the hub on the vehicle, a wheel spindle journalled is said hub, a wheel secured to the spindle for rotation with the spindle, comprising: a hubcap anchored to said hub, an input speedometer drive shaft fixed at one end to the end of said wheel spindle and journalled in said hubcap for rotation with and along the axis of said wheel spindle, and means for interconnecting said speedometer drive shaft with a flexible speedometer drive cable.

4,202,561

COLLAPSIBLE BICYCLE

Edward H. Yonkers, 83 Eldredge St., Newton, Mass. 02150

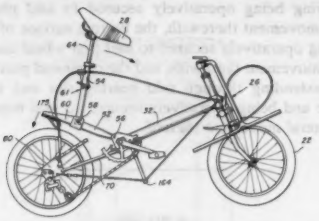
Continuation-in-part of Ser. No. 823,708, Aug. 11, 1977, abandoned. This application Jun. 1, 1978, Ser. No. 911,375

Int. Cl.² B62K *15/00*

U.S. Cl. 280—278 **32 Claims**

1. A wheeled vehicle comprising
a head tube and a down tube connected together,
a bottom bracket assembly connected to the rear end of the down tube,
a seat tube having its lower end pivotally mounted on the bottom bracket assembly,

a chain stay having its forward end also pivotally mounted on the bottom bracket assembly,



and means including a cable assembly and having cable means on each side of the vehicle interconnecting the head tube with the seat tube and with the chain stay.

4,202,562

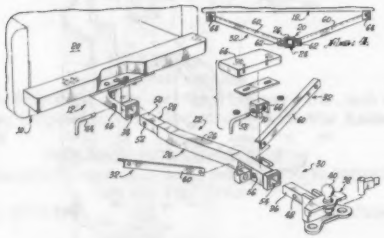
TRAILER HITCH

Conrad L. Sorenson, 1232 N. Euclid Ave., Upland, Calif. 91786

Filed May 15, 1978, Ser. No. 905,847

Int. Cl.[2] B60D *1/00*

U.S. Cl. 280—415 R **16 Claims**



1. An auxiliary towing hitch extension for attaching a trailer having a front towing hitch to a towing vehicle having a rear towing hitch and a removable body which overhangs the rear end of said vehicle a substantial distance, comprising:

said vehicle hitch having a rearwardly opening coupling socket and said trailer hitch having a downwardly opening coupling socket for a coupling ball,

a removable tow bar having normally front and rear ends,

front coupling means at the front end of said tow bar for releasable coupling engagement with said vehicle hitch,

said front tow bar coupling means comprising a longitudinally extending coupling tongue at the front end of said tow bar for insertion into said vehicle coupling socket, and means for releasably securing said tongue in the latter socket, and

rear coupling means at the rear end of said tow bar for releasable coupling engagement with said trailer hitch,

said rear tow bar coupling means comprising a rearwardly opening longitudinal coupling socket at the rear end of said tow bar, a coupling element including a coupling tongue removably engaged within said tow bar coupling socket and adapted for engagement in said vehicle coupling socket when said tow bar is not used and an upstanding coupling ball at the rear end of said coupling element tongue for removable engagement in said trailer coupling socket, and means for releasably securing said coupling element to said tow bar.

4,202,563

INDEPENDENT WHEEL SUSPENSION FOR MOTOR VEHICLES, ESPECIALLY FOR PASSENGER MOTOR VEHICLES

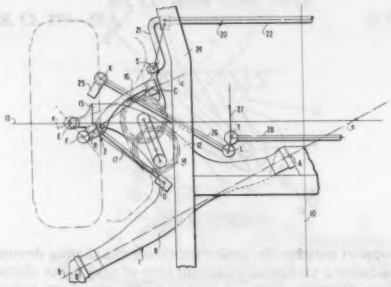
Peter Tattermusch, Esslingen, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 26, 1977, Ser. No. 836,614

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1976, 2642939

Int. Cl.[2] B62D *7/20*

U.S. Cl. 280—675 **53 Claims**



1. An independent wheel suspension for suspending a vehicle wheel at a frame of a motor vehicle, comprising:

a wheel carrier means for rotatably supporting a vehicle wheel,

first and second wheel guide means for guidingly connecting the wheel carrier means to the frame, said second wheel guide means including a coupler means and a rod means, said rod means being pivotably connected to the frame,

said wheel carrier means being pivotably connected to both of said wheel guide means and having a fixed pivot axis with respect to said first wheel guide means, said fixed pivot axis being determined by a first pivotal connection point at the wheel carrier means and the first guide means and a second pivotal connection point at the coupler means and the first guide means.

4,202,564

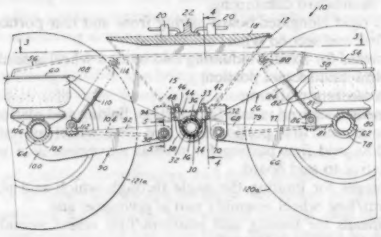
TANDEM AXLE SUSPENSION SYSTEM

Don S. Strader, Marietta, Ga., assignor to Motor Wheel Corporation, Lansing, Mich.

Filed Sep. 7, 1978, Ser. No. 940,182

Int. Cl.[2] B60G *5/04*

U.S. Cl. 280—678 **22 Claims**



10. In an axle suspension system of the type which includes an axle, axle support means extending laterally of said axle, hanger means adapted to be coupled to a vehicle frame and a bushing assembly for pivotally securing said axle support means to said hanger means, the improvement wherein said bushing assembly comprises a pair of polygonal openings in said hanger means spaced from each on a common axis gener-

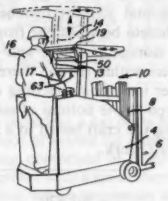
ally parallel to said axle, an eye on said axle support means received in said hanger means between said openings, mounting blocks having polygonal cross sections received in said openings and central bores aligned on an axis offset from said common axis of said openings, bushing means telescopically received in said eye and including bushing rod ends projecting through said block bores, and means coupled to said rod ends selectively for loosening said blocks in said openings such that said blocks may be rotated within said openings eccentrically about said common axis for step-wise adjustment of axle alignment and for clamping said blocks within said openings such that said polygonal block cross sections cooperate with said polygonal openings inherently to resist rotation within said openings.

4,202,565

RETRACTABLE OVERHEAD GUARD

Duane L. Mosch, Muscatine, Iowa, assignor to HON Industries Inc., Muscatine, Iowa

Filed Jun. 2, 1978, Ser. No. 911,787
Int. Cl.[2] B60J 7/24
U.S. Cl. 280—756 **11 Claims**



1. In a vehicle including a lifting mechanism and having a position for a riding operator, a retractable overhead guard assembly including: generally vertically extending support means having a lower portion secured to said vehicle, and an upper portion selectively extensible upwardly and retractable downwardly relative to said lower portion; an operator guard supported on said upper portion for vertical adjustment therewith as said upper portion is extended and retracted relative to said lower portion; and sliding support means connecting said guard to said upper portion including channel means and channel cooperating roller means for sliding cooperation with said channel means, for generally horizontal selective sliding movement of said guard relative to said upper portion between a first position superposed to said operator position for protecting an operator thereat, and a second position displaced from said first position whereby said upper portion and said guard may be retracted adjacent such an operator.

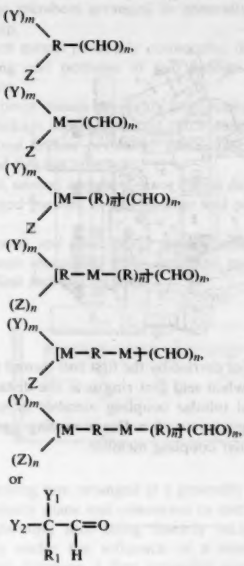
4,202,566

HEAT-SENSITIVE RECORDING OR COPYING MATERIAL

Horst Kosche, Düren, Fed. Rep. of Germany, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 24, 1978, Ser. No. 908,888
Claims priority, application Fed. Rep. of Germany, May 28, 1977, 2724295; Jul. 1, 1977, 2729739
Int. Cl.[2] B41M 5/18, 5/22
U.S. Cl. 282—27.5 **16 Claims**

1. In a heat sensitive recording or copying material which contains, in its color reactant system; a color-producing acceptor as the developer for the color-forming agent, the improvement wherein the developer contains at least one member which is the reaction product of an electronegatively substituted aldehyde and an aliphatic organic compound containing hydroxyl groups, such that the aldehyde moiety is bonded to the radical of said aliphatic organic compound via at least one oxygen atom, said electronegatively substituted aldehyde being an electronegatively substituted mono- or polyaldehyde, wherein at least one such electronegative substituent is halo or cyano and interacts electromerically with at least one aldehyde group thereof, said aldehyde having the formula



wherein

R is a substituted or unsubstituted, saturated or unsaturated aliphatic radical,

M is a substituted or unsubstituted aromatic, aromatic-cycloaliphatic, aromatic-heterocyclic or heterocyclic radical with aromatic properties,

Y is halo or cyano,

Z is hydrogen or an acid group,

m and n are independently an integer of 1 to 6,

Y_1 is hydrogen or halogen,

Y_2 is halogen, and

R_1 is hydrogen, carboxyl, alkyl of 1 to 3 carbon atoms, halogenoalkyl of 1 to 3 carbon atoms, phenyl, benzyl or halogenobenzyl.

4,202,567

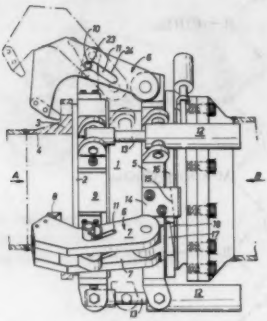
COUPLING INCLUDING A TUBULAR COUPLING MEMBER TO BE COUPLED TO A FLANGE

Arthur L. Paddington, Whitstable, England, assignor to David Brown-Vosper (Offshore) Limited, Portchester, England

Filed Aug. 3, 1978, Ser. No. 930,743
Claims priority, application United Kingdom, Aug. 3, 1977, 32635/77
Int. Cl.[2] F16L 23/00
U.S. Cl. 285—18 **4 Claims**

1. A coupling comprising a tubular coupling member to be coupled to a flange and having a surface against which a flange can rest, a first ring slidable externally on the tubular coupling member, a plurality of hooks pivotably carried by the ring, co-operating cam surfaces formed on or carried by the tubular coupling member and the hooks, moving means for moving the first ring away from the said surface during which motion the action of the cam surfaces is to bring the hooks into positions in which they retain a flange resting against the said surface and urge the flange against the said surface, a second ring rotatable on said tubular coupling member, cam surfaces formed on or carried by said first and second rings and rotating

means for rotating said second ring for bringing said cam surfaces formed on or carried by said first and second rings into co-operation to prevent motion of said first ring towards said surface, said second ring being rotatable to bring the cam



surfaces formed on or carried by the first and second rings into co-operation only when said first ring is at the distance from said surface of said tubular coupling member in which the hooks are in engagement with a flange resting against said surface of said tubular coupling member.

4,202,568

TUBE JOINT

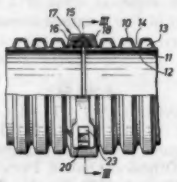
Torsten E. T. Ström, Fristad, Sweden, assignor to AB Gustavsberg, Fristad, Sweden

Continuation of Ser. No. 725,451, Sep. 22, 1976, abandoned. This application Mar. 20, 1978, Ser. No. 888,418

Claims priority, application Sweden, Sep. 25, 1975, 7510733; Feb. 4, 1976, 7601178

Int. Cl.[2] F16L *23/00, 47/00*

U.S. Cl. 285—336 **15 Claims**



1. A combination tube joint consisting essentially of a joint including two aligned adjacent extruded nometallic tubes each having a corrugated outer wall and a reversibly corrugated inner wall, said corrugations extending along the entire length of said tubes, the roots of the corrugations of the inner wall and the outer wall being joined, an annular space formed by the inner and outer walls of each tube at the end of said tube and opening in a plane passing transversely through the crest of the outer wall, an annular intermediary sealing ring disposed within said space in each tube and extending between the aligned adjacent ends of the tubes, and a lock ring applied around the tube ends and engaging the corrugated outer wall of each tube to press by cam action the tube ends against the intermediary sealing ring from opposite sides of said sealing ring when tightened about the tube ends.

4,202,569

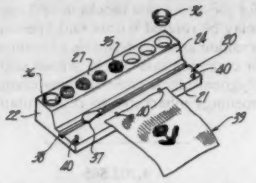
CRAFT BOARD

Frieda P. Thuringer, 2755 Hillcrest Dr., Wellsville, N.Y. 14895

Filed Mar. 23, 1978, Ser. No. 889,280

Int. Cl.[2] D04G *3/02*

U.S. Cl. 289—18.1 **6 Claims**



1. A craft board including a horizontal support member and a tapered vertical storage member depending therefrom, a plurality of fastening means fixedly connected to the top of the horizontal support member in a spaced relationship, and means to store the work materials within the vertical storage member, wherein the horizontal support member has a longitudinal recess provided therein between the front of said craft board and said vertical storage member, and said vertical storage member has recesses within the top thereof of a circular cross section, and further including attaching means in the form of suction cups secured to the bottom of said craft board for the purpose of securing the craft board to a substantially flat surface during the craft work.

4,202,570

DOOR LOCK FOR SLIDING DOORS

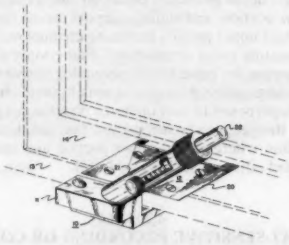
Robert J. Riggins, 1503 Rand St., Boise, Id. 83705

Filed May 5, 1975, Ser. No. 574,492

The portion of the term of this patent subsequent to Jul. 13, 1994, has been disclaimed.

Int. Cl.[2] E05C *5/00*

U.S. Cl. 292—60 **2 Claims**



1. A latch for sliding panel structures which include a fixed casement and a panel slidably mounted in said casement, comprising:

a catch comprising a flanged portion and a striker plate portion issuing from one of the terminal ends of said flange, the uppermost terminal side of said striker plate portion including at least one hole being bored at an acute angle; and

a bolt assembly including a mounting plate, a hollow cylindrical barrel jointed at an acuted angle to said striker plate, a bolt slidably carried within said barrel, said mounting plate being fastened to said sliding panel, and said catch being mounted to said casement suitably for said bolt to be engageable with said acutely oriented hole of said catch, means urging said bolt in the direction of said catch, and means determining travel of said bolt in said barrel, said means determining the travel of said bolt is provided by a

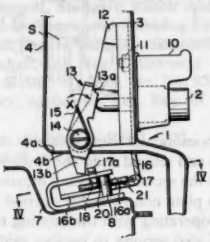
slot having a major portion thereof disposed in alignment with the rectilinear axis of said barrel, and an operating knob connected to said rod by means of a stem which is disposed through said slot.

4,202,571

LOCKING MEANS FOR AUTOMOBILE REAR DOORS

Tsutomu Nishikoori, Hiroshima, Japan, assignor to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Filed Jul. 14, 1978, Ser. No. 924,557
Claims priority, application Japan, Jul. 18, 1977, 52-96044[U]
Int. Cl.² E05C *3/24*
U.S. Cl. 292—216 **4 Claims**



1. In an automobile including a car body formed with a rear opening, and a rear door provided for closing said opening in the car body and being comprised of outer and inner panels which are secured together with a space therebetween; locking means for the rear door which comprises striker means provided on the car body, latch lever means mounted on the door and movable between a locking position wherein it engages with the striker means and an unlocking position wherein it is disengaged from the striker means, bias means for biasing the latch lever means toward the unlocking position, claw lever means mounted on the door and adapted to engage with the latch lever means for releasably holding the latch lever means in the locking position, unlocking lever means pivotably mounted on said door and have an operating portion adapted to engage with an engagement portions of said claw lever means, push button type actuating means mounted on said outer panel of the door for actuating, when depressed, the unlocking lever means so as to let it drive the claw lever means in a direction of releasing the latch lever means whereby the latch lever means is moved under the action of the bias means to the unlocking position, the improvement comprises the fact that said unlocking lever means is carried in the space of the door by said outer panel at an area close to said actuating means, said claw lever means and said latch lever means being carried by said inner panel, said unlocking lever means being carried by said outer panel having said operating portion located entirely forward of said claw lever means engagement portion and adapted to engage therewith upon a rearward movement to drive said claw lever means in the direction of releasing the latch lever means, whereby even when the outer panel is deformed in a crash the unlocking lever means is not moved into driving engagement with the engagement portion of the claw lever means.

4,202,572

LATCH FOR ESCAPE DOOR

William M. Green, 27830 Orchard Lake Rd., Farmington, Mich. 48024

Filed Apr. 24, 1978, Ser. No. 898,815
Int. Cl.² E05C *7/00*
U.S. Cl. 292—217 **1 Claim**

1. A latch assembly particularly adapted for escape doors and the like, comprising,

a catch member,

means supporting said catch member for rotating movement about a first axis between a locking position and an unlocking position,

a toggle linkage for causing said catch member to be moved between said positions and comprising first and second linkage members arranged in generally end-to-end relationship,

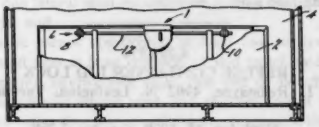
first pivot means pivotably connecting the respective confronting end portions of said linkage members to one another,

second pivot means pivotably connecting one end of said first linkage member to said catch member,

third pivot means pivotably connecting one end of said second linkage member,

said first, second and third pivot means defining pivotal axes arranged parallel to one another and parallel to said first axis,

said second and third pivot means being located along a common imaginary plane arranged generally parallel to said first and pivotal axis,



an operating arm arranged at a generally right angle to said imaginary plane and connected to said toggle linkage,

said operating arm being linearly reciprocably movable solely under the influence of a manual force applied thereto between a first extended position wherein said toggle linkage members are disposed in a first over-center position with first pivot means being located on one side of said imaginary plane and said catch member disposed in said locking position, and

a second retracted position wherein said toggle linkage members are disposed in a second over-center position with said first pivot means being located on the opposite side of said imaginary plane and said catch member disposed in said unlocking position,

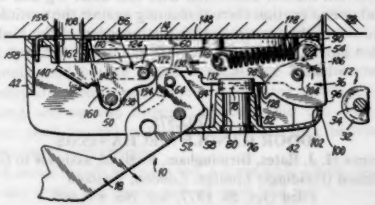
said operating arm being the sole means for causing said toggle linkage members to move between said first extended position and said second retracted position.

4,202,573

SAFETY CLOSURE SYSTEM

Irving L. Berkowitz, Binghamton, and John J. Bourgeois, Kirkwood, both of N.Y., assignors to Kason Hardware Corporation, Binghamton, N.Y.

Filed Jul. 11, 1977, Ser. No. 814,408
Int. Cl.² E05C *3/16*
U.S. Cl. 292—223 **2 Claims**



1. A safety method of unlocking a door to an enclosure from within the enclosure, said door carrying a latch assembly having a movable keeper latch member normally influenced by unlocking movement of a latch handle and adapted to releasably engage and be captively held by a substantially stationary

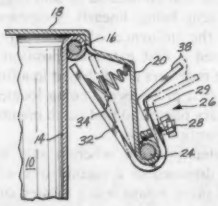
striker member when in a locked condition, the method comprising the steps of: urging a safety actuating member from a locked position to an unlocking position, translating said movement of said actuating member into arcuate movement of a lever member which is normally biased in a locking direction opposite with respect to that of said arcuate movement, said biasing normally inhibiting said lever member arcuate movement during times when said actuating member is not in said unlocking position, said step of translating further causing movement of a link member interconnecting said lever and said movable keeper latch member from a locking position to an unlocking position; said step of translating yet further causing arcuate movement of said keeper latch member from substantially interfering locking relationship with respect to said striker member and permitting ingress to and egress from an enclosure normally closed by a door carrying said keeper latch member without requiring unlocking movement of said latch handle, said step of translating still further being capable of causing movement of internal interfering surfaces of said link member from an interfering locking position with respect to a locking cam member influenced by a locking cylinder to non-interfering positions.

4,202,574

REFUSE CONTAINER LID LOCK

William L. Redmayne, 4902 N. Lexington, Tacoma, Wash. 98407

Filed Jan. 15, 1979, Ser. No. 3,289
Int. Cl.[2] E05C *3/14, 3/22, 19/16*
U.S. Cl. 292—228 **2 Claims**



1. In combination with a cylindrical refuse container having a cylindrical, vertical wall terminating in an upper, circular bead and a telescopically fitting and removable cover having a cylindrical, vertical cover terminating in a lower circular bead, a substantially U-shaped bracket having an inner curved wall surface slidingly interfitting the outer wall of the circular bead of the removable cover, having an inner leg, and having an outer leg extending outwardly and having its outer and portion substantially at right angles to said outer leg and functioning as a fingerengagable portion; means for maintaining said inner curved surface in detachable sliding engagement and in contact with said outer surface of said circular bead of the removable cover; and compression spring means, having one end portion thereof connected with said inner leg and having the other end portion thereof reacting against the vertical wall of the removable cover, urging the inner leg of the U-shaped bracket into engaging position with and below the bead of the refuse container.

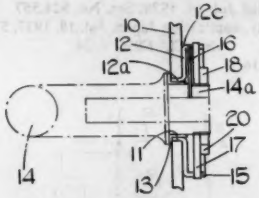
4,202,575

DOOR HANDLE MECHANISMS

Laurence H. J. Bates, Birmingham, England, assignor to G. & S. Allgood (Holdings) Limited, London, England

Filed Oct. 20, 1977, Ser. No. 844,090
Claims priority, application United Kingdom, Oct. 22, 1976, 44043/76
Int. Cl.[2] E05C *13/00*
U.S. Cl. 292—347 **6 Claims**

1. A door handle mechanism comprising a mounting plate intended for securement, in use, to a door, means defining a non-circular aperture through said mounting plate, a housing disposed at one side of the mounting plate, the housing having non-circular formations thereon engaging in said non-circular aperture non-rotatably to mount the housing relative to the mounting plate and to define a further non-circular aperture through said housing, a washer non-rotatably engaged in said further aperture and having a circular internal bore therethrough, a handle having a part projecting through said circular bore into said housing and being rotatable therein, a torsion spring having first and second ends, the first end being located in the housing and the second end being located in said part of the handle, a stop plate non-rotatably carried by said part of the handle and cooperating with the housing to limit rotation of the handle and also serving to enclose said torsion spring within the housing, and means for securing the stop plate onto said part of the handle.

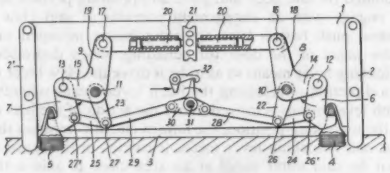


4,202,576

DEVICE FOR LOCKING TO FIXED SUPPORTS LOADS CARRIED UNDER AIRCRAFT

Jean H. Hasquenoph, Lagny, and Pierre F. Coutin, Paris, both of France, assignors to R. Alkan & Cie, France

Filed Oct. 6, 1978, Ser. No. 949,484
Claims priority, application France, Dec. 30, 1977, 77 39818
Int. Cl.[2] B64D *1/02*
U.S. Cl. 294—83 R **3 Claims**



1. In a suspension device for carrying a load under an aircraft comprising a pair of pivoting suspension hooks adapted to engage suspension members disposed at the upper part of the load and fixed supports adapted to be engaged by the load to wedge same, a device for locking said load which comprises:

a pair of bell-crank levers each pivoted to a fixed point of the suspension device, each one of said suspension hooks being pivoted at a first arm of one of said bell-crank levers,

a screw-type stretching device having an end pivoted to a second arm of one bell-crank lever of said pair of bell-crank levers and an opposite end pivoted to a second arm of the other bell-crank lever of said pair of bell-crank levers,

a pair of connecting links each pivoted at one end about the fixed pivot point of one of said bell-crank levers,

a link pivotally connecting each suspension hook to the corresponding connecting link, so as to constitute a parallel motion with the suspension hook, the first arm of the bell-crank lever and the connecting link,

a pair of connecting rods, each connecting rod connecting

the connecting link associated to one suspension hook to one end of a central rocker,

and a detent positioning device preventing said rocker to pivot in a direction allowing a pivotal opening movement of the suspension hooks,

so that by action on said stretching device is obtained a simultaneous, substantially rectilinear upward movement of translation of each suspension hook causing the load to engage said suspension members while the efforts exerted on each hook are equally distributed.

4,202,577

MOTOR VEHICLE PROVIDED WITH A HATCH-BACK DOOR CLOSING OFF A STORAGE SPACE

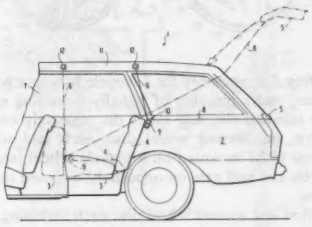
Werner Breitschwerdt, Stuttgart; Rudolf Andres, Sindelfingen; Werner Heiss, Doffingen, and Wolfgang Fussnegger, Gartringen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 31, 1978, Ser. No. 938,364

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1977, 2739741

Int. Cl.[2] B60R *7/00*

U.S. Cl. 296—24 R **10 Claims**



1. A motor vehicle provided with a hatch-back door closing off a storage space, and first means adapted to separate the storage space from a passenger space, characterized in that the first means includes a first retractable blind means adapted to be fastened in an extended position within a roof area of the motor vehicle, means are provided for covering off a stored item in the storage space including a second retractable blind means having a free end fastened within an area of the hatch-back door, the first and second blind means each have an axis of rotation which extends at least approximately in a transverse direction of the motor vehicle, and in that means are operatively connected with the first blind means for preventing the first blind means when not fully extended from being further pulled out by one of a strong deceleration or a striking by items stored in the storage space.

4,202,578

DEVICE FOR AUTOMATIC LIFTING OF THE REAR PANEL OF AN AUTOMOBILE EQUIPPED WITH A TAILGATE

Lucien Roullier, Paris, and Dominique Pastourel, Boissy, both of France, assignors to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Sep. 18, 1978, Ser. No. 943,187

Claims priority, application France, Sep. 16, 1977, 77 28104

Int. Cl.[2] B60R *5/04*

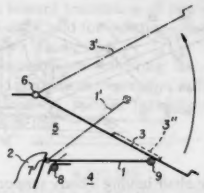
U.S. Cl. 296—37.16 **8 Claims**

1. A device for access to the luggage compartment located in the rear of an automobile comprising:

a rear tailgate hingedly connected to an upper part of the rear of said automobile for movement to an upper, open position and to a lower, closed position balanced by an appropriate compensation system;

a panel provided with front and rear edge portions and lateral sides defining a plane, said panel being mounted horizontally between a rear seat of said automobile and said tailgate with said rear edge portion engaging said tailgate in said lower, closed position;

elastic means for automatically raising said panel while pivoting on the front edge thereof located away from said tailgate, said panel being lowered automatically against the action of said elastic means upon closing of said tailgate;



at least one lateral strut mounted on at least one side of said vehicle; and

said elastic means comprising at least one torsion spring mounted near at least one side of said panel, said at least one spring having two ends, one end of which is supported on said lateral strut, and another end of which is supported against said panel and in engagement therewith.

4,202,579

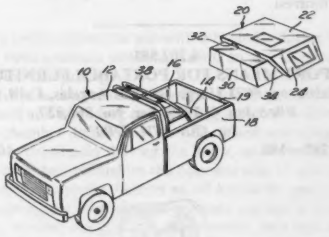
CAMPER SHELL STRUCTURE

Donald R. Berggren, 2717 Arlene Ct., Simi Valley, Calif. 93065

Filed Jul. 21, 1978, Ser. No. 927,170

Int. Cl.[2] B60P *3/32*

U.S. Cl. 296—156 **2 Claims**



1. In combination with a land vehicle, said land vehicle having a cab section and a load carrying section located aft of said cab section, said load carrying section comprising a planar horizontal bed having raised vertical side walls, a roll bar assembly attached to said vehicle and located within said load carrying section and directly adjacent said cab section, a camper shell located within said load carrying section, the improvement comprising:

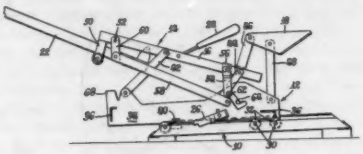
said camper shell having a top, a front wall, a back wall and side walls, the major part of each said side wall of said camper shell being located substantially in the same plane as the respective said raised vertical side wall of said load carrying section, a portion of each said side wall of said camper shell being inwardly recessed in the area directly adjacent said front wall, said roll bar assembly located within said recessed area.

4,202,580

SEQUENCING LOCK FOR RECLINER

Carl B. Johnson, Pontiac, Ill., assignor to Pontiac Furniture Industries, Inc., Pontiac, Ill.

Filed Nov. 13, 1978, Ser. No. 959,465
Int. Cl.[2] A47C 1/02
U.S. Cl. 297—84 **3 Claims**



1. In a reclining chair having a body support including a seat and a backrest, said body support being movably mounted upon a base for adjustment thereon between an upright sitting position and a reclining position, a footrest movable from a retracted position to an extended position to support the extended legs of the occupant, and means actuated by the occupant independently of the adjustment of the body support to move said footrest between said retracted and extended positions:

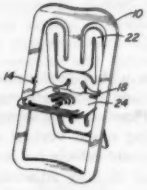
the improvement comprising a locking member connected both to the footrest and to the body support so as to have a first mode of movement relative to the base in response to extension and retraction of the footrest and a second mode of movement relative to the base in response to the movement of the body support between the sitting and reclining positions, and a connection between said member and said base substantially limiting the movement of said locking member in each said mode to a given path relative to the base, each of said two resulting paths permitting one mode of movement while preventing the other and converging at a point on both paths corresponding to the extended position of the footrest, the arrangement thereby requiring the extension of the footrest as a preliminary to recline of the body support, and the righting of the body support as a preliminary to retraction of the footrest.

4,202,581

SUPPORT MEANS FOR PORTABLE FURNITURE

Gregg Fleishman, 6071 Hargis St., Los Angeles, Calif. 90034

Filed Jan. 4, 1978, Ser. No. 866,837
Int. Cl.[2] A47C 7/00
U.S. Cl. 297—440 **10 Claims**



1. A collapsible chair assembly comprised of:

a seat member;

a generally planar, one-piece support member made of flexible material having a back portion and a tab portion adapted to be unfolded away from the plane of said back portion to define a bifurcated structure;

said seat member having first mounting means adapted to be engaged with corresponding second mounting means positioned on the back and tab portion of the support member and adapted to maintain said back and tab portions in a spaced configuration;

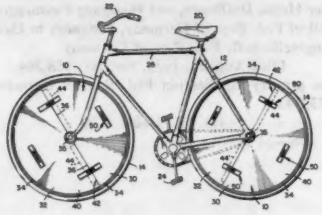
said corresponding second mounting means releasably engaging and supporting said seat member by and between said back and tab portions.

4,202,582

CYCLE SAFETY DISC

Irving E. Seltman, 806 A Round Pond Rd., Lake Ronkonkoma, N.Y. 11779

Filed Sep. 27, 1978, Ser. No. 946,142
Int. Cl.[2] B60B 7/00
U.S. Cl. 301—37 SA **4 Claims**



1. A safety disc assembly for a bicycle having a wheel with an axle, rim, and a plurality of radially extending spokes between the axle and rim, said safety disc assembly comprising:

A. a first and second wheel disc, each said wheel disc adapted to be mounted on a bicycle wheel intermediate said rim and said axle on oppositely disposed sides of the spokes,

B. said first and second wheel disc each including a pair of co-acting disc members, each one of said disc members including a contoured outer perimeter and a contoured inner perimeter with a terminal wall extending therebetween, said contoured perimeters adapted to extend in spaced relationship to the rim and to the axle, respectively,

C. alignment means for permitting abutting engagement between each pair of said disc members on said first and second wheel disc so as to permit said disc members to be assembled on the wheel without the removal thereof,

D. said alignment means includes:

(1) a lip extending outwardly from said terminal wall on each one of said disc members,

(2) said lips are adapted to extend in overlapping engagement with a portion of the other said disc member in the assembled position of each said wheel disc,

(3) each said wheel disc includes one of said lips that extend between said inner perimeter and said outer perimeter,

(4) each one of said lips includes a free end, an inner end and an outer end, and

(5) said inner end of each one of said lips of said disc members is in overlapping relationship with a portion of a corresponding said disc member and said lip is continuous along its length thereof,

E. coupling means for removably retaining said first and second wheel discs in assembled relationship to each other on opposite sides of the spokes on the wheel,

F. said coupling means including:

(1) at least two pair of apertures in each one of said wheel discs,

(2) a pair of fasteners, each said fastener adapted to extend through one pair of said apertures, and the spokes for removably securing said first and second wheel discs to each other on opposite sides of the spokes,

(3) each said fastener including a base with a pair of prongs adapted to extend through a respective one of said pairs of apertures,

(4) a holding clamp associated with each said fastener, for retaining said prongs in removably fixed relationship with respect to said wheel discs, and

(5) at least one of said pair of apertures formed in a respective pair of said disc members adjacent said terminal wall thereof such that said base and said holding clamp extend across said disc members so as to retain said lips in overlapping relationship during use of the bicycle, and

G. said disc member each includes oppositely disposed side walls intermediate said contoured perimeters and said outer end of said lip coincides with one of said side walls.

4,202,583

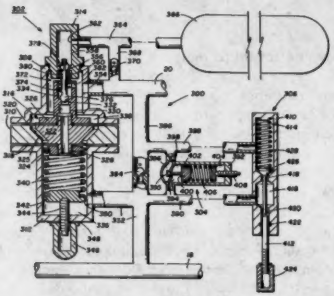
BRAKE CONTROL APPARATUS FOR RAILWAY CARS

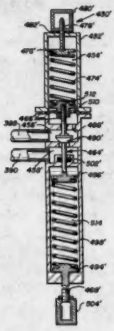
William R. King, 1909 Sunshine Sq., Longview, Tex. 75601

Continuation-in-part of Ser. No. 775,379, Mar. 7, 1977, Pat. No. 4,143,923. This application Sep. 5, 1978, Ser. No. 939,651

Int. Cl.[2] B60T *8/18*

U.S. Cl. 303—22 R **6 Claims**





1. For railway cars having sprung and unsprung portions, a brake control apparatus interposed between a pressurized brake pressure supply line with a train brake valve therein and a pressurized brake cylinder line connected to the brakes of the railway car for transmitting a pressure drop signal responsive to operation of the train brake valve, said apparatus comprising:

structure defining a first chamber having a port connected to the brake pressure supply line for receiving the pressure drop signal from the train brake valve;

structure defining a second chamber having a port connected to the brake cylinder line for transmitting a predetermined pressure drop signal to the railway car brakes;

valve means for selectively connecting the first and second chambers;

diaphragm means movably abutting the second chamber and connected to the valve means for biasing said valve means open responsive to the pressure in the brake cylinder line;

means for applying to said diaphragm means a predetermined bias to urge said valve means closed;

a strut mounted for translation responsive to the relative positioning of the sprung and unsprung portions of the railway car;

a spring coupled between the strut and valve means for applying to said valve means a predetermined bias proportional to the inward translation of said strut to urge said valve means open, and for isolating vibration of said strut from said valve means; and

check valve means interconnecting the first and second chambers and responsive to pressure differential for equalizing said chambers upon a pressure rise in the brake pressure supply line.

4,202,584

ANTI-SKID BRAKE CONTROL DEVICE AND ASSOCIATED METHOD

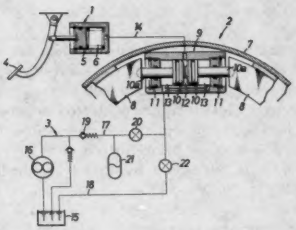
Makoto Sato, Kamifukuoka; Hiroshi Takamatsu, Ohimachi; Yoshitaka Miyagawa, Kawagoe, and Etsuo Fujii, Wako, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 762,782, Jan. 25, 1977, Pat. No. 4,129,342. This application Jan. 20, 1978, Ser. No. 871,187

Claims priority, application Japan, Jan. 29, 1976, 51-8682; Feb. 2, 1976, 51-10195; Feb. 16, 1976, 51-15607

Int. Cl.[2] B60T *8/08*

U.S. Cl. 303—105 **2 Claims**



1. In a brake system for use with wheeled vehicles including a brake fluid pressure producing unit, an anti-skid brake control device comprising:

an oil-hydraulic brake mechanism associated with a vehicle wheel and including an operating member, a first hydraulic chamber defined on one side of said operating member for hydraulically driving the latter, and a second hydraulic chamber defined on the opposite side of said operating member to apply thereon an oil-hydraulic pressure counteracting the oil-hydraulic pressure applied to said operating member on said one side thereof, said first hydraulic chamber being held in fluid communication with said brake fluid pressure producing unit;

a source of fluid pressure;

a high-pressure fluid line extending between said second hydraulic chamber in said brake mechanism and said source of fluid pressure;

an oil reservoir;

a low-pressure fluid line extending between said second hydraulic chamber in said brake mechanism and said oil reservoir;

fluid control valve means inserted in said high-pressure and low-pressure fluid lines; and

command system means connected with said fluid control valve means for effecting a repeated braking process in which the braking torque as applied to the wheel begins to decrease when the angular deceleration of the wheel exceeds a predetermined threshold valve, then begins to increase when the angular wheel deceleration decreasing

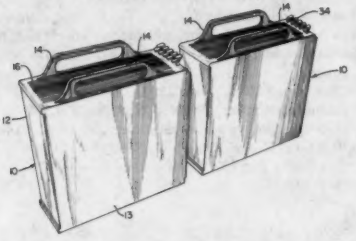
with decrease in the braking torque is reduced below said predetermined threshold value, is subsequently held at a definite level during the period of time that the angular acceleration of the wheel arising upon disappearance of the angular wheel deceleration is held above a predetermined threshold value, and finally begins again to rise when the angular acceleration of the wheel falls below its said predetermined threshold value.

4,202,585

PORTABLE STORAGE MODULES FOR FLOPPY DISKS AND THE LIKE

Cary R. Lawler, Broomfield, Colo., assignor to The A-Team, Inc., Broomfield, Colo.

Filed Jul. 19, 1978, Ser. No. 925,940
Int. Cl.[2] A47B *81/06*
U.S. Cl. 312—15 **14 Claims**



1. In a storage container for a plurality of thin, flat recording disks wherein said storage container is a multi-sided enclosure having slotted compartments in one side thereof, each compartment provided with an entrance adapted to permit insertion of a disk into said compartment and provided with ejector means in each compartment being responsive to depression of a push rod and the like to eject a disk therefrom, the improvement comprising:

a plurality of storage modules interconnected to define a slotted compartment between each adjacent pair of modules, each module comprising a generally rectangular panel having opposite flat surfaces, upstanding ribs on one of said surfaces extending substantially continuously along the perimeter of said rectangular panel except at the entrance and forming spacing members between the surfaces of said rectangular panel and a guide rib in spaced-apart parallel relation to one of said upstanding ribs, said one of said upstanding ribs and said guide rib including nubs thereon and forming a channel for movement of said push rod between said parallel ribs and their associated said nubs in directions parallel to the plane of said modular panel, and grooves on the opposite surface of each module adapted to mate with said ribs in the one surface of an adjacent module to form a slotted compartment between said modules;

selector tab means at the end of each said push rod projecting externally of said container unit and adapted to be depressed to actuate said ejector means to advance a selected disk therefrom; and

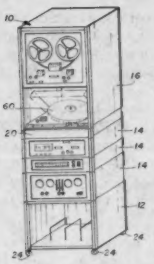
positioning means on said container adapted for positioning one container with respect to another container, said positioning means including a pair of upstanding shoulders on one side of said container defining a recessed area therebetween and a ribbed portion on the opposite side of said container formed by relieved corner portions of opposite aligned edges of said modules whereby the recessed portion of each container is adapted to nest with the ribbed portion of another container.

4,202,586

STACKABLE FURNITURE MODULES HAVING REPLACEABLE PANELS

Terry R. Oplinger, 34177 Whittaker, Mt. Clemens, Mich. 48043

Filed Sep. 28, 1978, Ser. No. 946,577
Int. Cl.[2] A47B *87/00*
U.S. Cl. 312—107 **3 Claims**



1. Stackable furniture modules having identical size as to width and depth adapted for mounting of electronic components therein comprising:

a lower module supported by casters having an open front, closed side, back, and bottom members, a first pair of vertical corner members affixed to the front end of the side members, a transverse support member across the top of the front extending between first corner members, an open top having a first upper recess along the inner surface of the top edge removing half of the thickness of the side member, defining a nesting dimension, said first recess extending below the top edge a distance, including means in the bottom member of said lower module for defining a record storage space;

an intermediate module having closed sides, bottom, and partially closed back, a second pair of vertical corner members affixed to the front end of the sides, a pair of vertical grooves on the inside edge of the second corner members spaced back from the front edge of the sides, one per second corner member, a slidable front panel having thin vertical projections along both ends to slidingly engage said pair of vertical grooves, a recess along the top inside edge of the panel to nestingly receive the front edge of the bottom member of a nesting unit, a second open top having a second upper recess along the inner surface of the top edge removing half the material from the sides, to equal said nesting dimension, said second upper recess extending below the top edge a distance, a first bottom recess along the outer surface of the bottom of the sides removing material to establish a size slightly less than said nesting dimension defining an insertable nesting dimension permitting the bottom of the intermediate unit to be slidingly nested into the nesting dimension of the lower unit, the recess extending up the side members, a distance less than the depth of said first and second upper recesses, the pair of vertical corner members extending from the top edge of the sides to the beginning of said first bottom recess, establishing said nesting dimension, said slidable front panel adaptable to mounting electronic components in a customized manner;

a record player with closed front, side, and rear walls, and a closed bottom wall, a pair of third vertical corner members affixed to the front edge of the side walls, a third recess cut along the inner surface of the top edge of the side walls to define said nesting dimension, a horizontal groove is disposed along the inner surface of the side walls spaced below the nesting recess to slidingly receive a sliding upper wall, the top edge of the rear wall is spaced below the bottom surface of the sliding upper wall, a portion of the rear wall cut away, and a third bottom

recess along the outer surface of the bottom of the side walls extending up the side walls a distance less than the depth of the recess for said nesting dimension, said recess defining an outer dimension for the third bottom recess less than said nesting dimension establishing the insertable nesting dimension to allow the record player module to be slidingly nested atop any unit having said nesting dimension.

4,202,587

CONTAINER WITH REPLACEABLE SECURITY LOCK FOR STORAGE OF INFORMATION CARRIERS

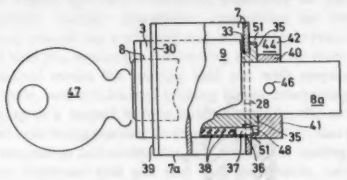
Jakob Wieland, Oberweningen, Switzerland, assignor to Bauer Kassenfabrik AG, Switzerland

Filed Mar. 17, 1978, Ser. No. 887,970

Claims priority, application Switzerland, Mar. 30, 1977, 3986/77

Int. Cl.[2] E05B *65/46*

U.S. Cl. 312—219 **7 Claims**



1. A security receptacle, particularly office furniture for storing secret information, with a demountable lock, the receptacle having a stationary portion and a movable portion, the receptacle comprising the combination of

a lock having a stator and a rotor, said rotor being movable only by a key belonging to said lock;

means in the stationary portion of the receptacle for receiving said stator, said means including a flat mounting base fixedly attached to said stationary portion, said base having means defining an opening for receiving said stator,

said stator having a free-standing collar protruding therefrom, said stator being mountable by insertion of said collar through said opening and rotation of said stator through a predetermined angle;

a releasable catch element for said stator having a blocking position in which said element engages said stationary portion to prevent reverse rotation and removal of said stator, and a release position, said catch element being accessible only from within said receptacle; and

a securing member fixedly attached to and movable with said rotor, said securing member comprising a protective wing covering and preventing access to said catch element in both the locked and unlocked key-removal positions of said rotor, said wing being movable to an uncovering position only by rotation of said rotor with its key to a position between the locked and unlocked positions thereof, whereby said lock is demountable from said stationary portion without damage only by using its key.

4,202,588

ELECTRICAL CONNECTOR AND SUPPORT MEANS THEREFOR

Chris A. Dalamangas, Union; Thomas P. Piccirillo, North Plainfield, and Donald P. Seip, Bridgewater, all of N.J., assignors to Technical Wire Products, Cranford, N.J.

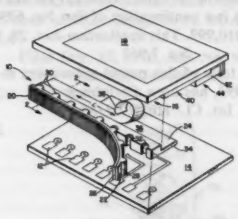
Filed Nov. 29, 1978, Ser. No. 964,638

Int. Cl.[2] H01R *13/48*

U.S. Cl. 339—59 M **12 Claims**

1. A support means for supporting a layered elastomeric electrical connector in operable position between two surfaces having electrically conducted areas thereon, the layered elastomeric electrical connector consisting essentially of a plurality of mutually parallel layers of alternately conductive and non-conductive elastomers, the layers arranged generally perpendicularly to said surfaces, the support means comprising:

(a) the first member of flexible elastomer having a first side fixed to one side of said layered elastomeric connector and



a second side opposite the first side comprising a plurality of engaging elements, and

(b) a second member more rigid than the first member, the second member slidably interlocked with the plurality of engaging elements of the first member.

4,202,589

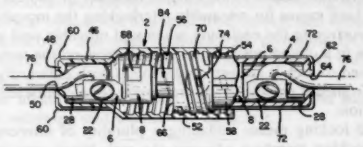
FUSE HOLDER

Robert P. Reavis, Jr., Statesville; Melvin A. Soderstrom, Advance; Vasantrai A. Vachhani, Kernersville, and Richard L. Hughes, Clemmons, all of N.C., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Sep. 25, 1978, Ser. No. 945,660

Int. Cl.[2] H01R *11/20*

U.S. Cl. 339—97 R **7 Claims**



1. In a fuse holder having first and second telescoping housing sections threadably secured together and containing a wire terminating electrical terminal having a resilient socket portion for pluggable connection to a fuse, the improvement comprising:

each said terminal having a sleeve portion connected to said socket portion by a web of said terminal,

said sleeve portion having a wire receiving, longitudinal open seam defined between wire gripping and insulation slicing jaws,

said seam including an enlarged open portion which communicates with one open end of said sleeve portion and which is spaced from said socket portion to define a wire receiving entry to said seam, so that an insulated wire, inserted into said entry and disposed longitudinally within said sleeve, includes a portion thereof looped back upon itself and pulled into and along said seam for slicing penetration of said jaws into the wire insulation and into engagement on the conductor portion of said wire,

each said terminal including an integral tab projecting outwardly from said sleeve portion and engaged on an end of a corresponding housing section to define a space between said housing section and said sleeve portion which receives said looped back portion of a corresponding wire.

4,202,590

INTERLOCK ARRANGEMENT FOR AN ELECTRICAL TERMINAL ENCLOSURE

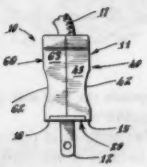
Ernest G. Hoffman, Middlefield, Conn., assignor to Harvey Hubbell, Incorporated, Orange, Conn.

Continuation of Ser. No. 868,217, Jan. 9, 1978, abandoned, which is a continuation of Ser. No. 772,672, Feb. 28, 1977, Pat. No. 4,067,634, which is a continuation of Ser. No. 609,797, Sep. 2, 1975, Pat. No. 4,010,999. This application Jan. 29, 1979, Ser. No. 7,061

The portion of the term of this patent subsequent to Mar. 8, 1994, has been disclaimed.

Int. Cl.[2] H01R *13/58*

U.S. Cl. 339—107 23 Claims



1. An interlock arrangement for a unitary molded enclosure for electrical terminals having portions thereof which are in fixed relationship to said terminals and at least one movable wall portion joined by a web hinge to the remainder of the enclosure, comprising

an enclosure formed of electrical insulating material having an interior chamber for housing electrical terminals, and having portions thereof which are in fixed relationship to said terminals and at least one movable wall portion;

an intergral web hinge joining one edge of said movable wall portion to an adjoining surface of a fixed portion of said enclosure to permit pivotal movement of said movable wall portion on said web hinge to an open position which provides access to the interior chamber of said enclosure;

locking means for releasably interlocking the movable wall portion to the enclosure when said movable wall portion is in a closed position, to relieve stress on the web hinge and to lock it against displacement both outwardly away from said enclosure and transverse to said outward direction;

said locking means including a plurality of interengaging locking members adjacent the web hinge, one integral with the movable wall portion and one integral with an adjacent fixed portion of the enclosure; and

said interengaging locking members engaging one another at a location inwardly of the web hinge when the movable wall portion is closed, and substantially in the transverse plane of said web hinge, to directly oppose any outward force on said web hinge.

4,202,591

APPARATUS FOR THE REMOTE GROUNDING, CONNECTION AND DISCONNECTION OF HIGH VOLTAGE ELECTRICAL CIRCUITS

Alan D. Borgstrom, Hackettstown, N.J., assignor to Amerace Corporation, New York, N.Y.

Filed Oct. 10, 1978, Ser. No. 949,544

Int. Cl.[2] H01R *13/52*

U.S. Cl. 339—111 17 Claims

1. Apparatus for enabling operation of a high voltage electrical connector from a remote location by the use of an insulated tool, such as a hot-stick, to effect selective grounding, and selective connection and disconnection of the connector and a terminal of an electrical apparatus, the connector having a terminal contact affixed to the conductor of a high voltage cable for electrically connecting the conductor to the terminal, said apparatus comprising:

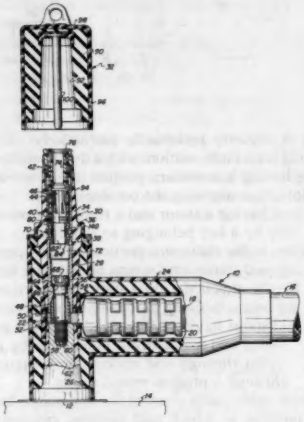
a generally tubular housing extending axially between opposite ends;

means for joining the housing to the terminal contact;

a female contact element carried by the housing adjacent one of the opposite ends thereof and including an axial opening therein for receiving a complementary male contact element;

a threaded fastener carried by the housing adjacent the other of the opposite ends for securing the terminal contact to the terminal of the electrical apparatus, the threaded fastener having a wrenching configuration aligned with the axial opening in the female contact element;

a fault-closing means carried by the housing for enabling the closing of a ground connection to the female contact element under a fault-closing condition, the fault-closing means having an aperture passing axially therethrough and aligned with the opening in the female contact element and with the wrenching configuration of the threaded fastener to establish an open passage to the



wrenching configuration through the female contact element and the fault-closing means; and

a tool including

a sleeve of conductive material receivable within the opening of the female contact element for making an electrical connection therewith;

a rod extending axially through the sleeve and having opposite ends, the rod being movable rotationally and axially relative to the sleeve;

a further wrenching configuration on the rod at one of the opposite ends, the further wrenching configuration being complementary to the wrenching configuration of the threaded fastener for engagement therewith; and

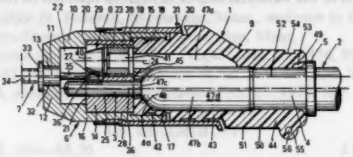
a coupling means on the rod at the other of the opposite ends for selectively coupling the rod to the insulated tool, whereby axial movement of the rod will pass the rod axially through the open passage and engage the complementary wrenching configurations, and rotation of the rod will selectively engage and disengage the threaded fastener and the terminal of the electrical apparatus.

4,202,592

SEALED ELECTRICAL CONNECTORS

Noël Rullier, Clamart, and Michel Benel, Fontenay-aux-Roses, both of France, assignors to Societe Anonyme dite: Ela Medical, France

Filed Apr. 21, 1978, Ser. No. 898,780
Claims priority, application France, May 6, 1977, 77 13816
Int. Cl.[2] A61N *1/36*; H01R *13/54*
U.S. Cl. 339—116 R **12 Claims**



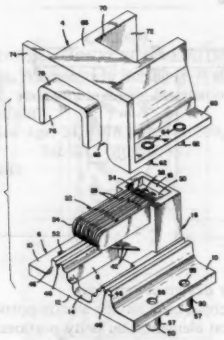
1. A sealed electrical connector, especially for use with an implantable cardiac stimulator, comprising an electrically insulated pin having a stripped end, a receptacle receiving said end of said pin, means for conducting electricity from said pin, mechanical means for locking said pin with respect to said receptacle, said mechanical locking means comprising a screw engaging in a tapped hole in said receptacle, the axis of said tapped hole being parallel to an axis along which said pin slides with respect to said connector, and means for sealing the connection between said pin and said receptacle, said sealing means having an opening through which said pin is engaged in said connector and also serving to seal said mechanical locking means without requiring separate sealing means, said mechanical locking means being accessible solely through said opening through which said pin is engaged in said connector.

4,202,593

JACK

Lynn W. Abernethy, Advance, and Elvert S. Watts, Walkertown, both of N.C., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Apr. 20, 1979, Ser. No. 31,791
Int. Cl.[2] H01R *13/54, 13/64*
U.S. Cl. 339—125 R **6 Claims**



1. In a jack having a housing containing a plurality of resilient contacts communicating with a cavity of the housing into which an electrical jack is plugged to connect electrically with the contacts, the improvement comprising:

said housing including a base portion providing an interior platform having grooves in which lengths of said contacts are supportred,

free ends of said contacts projecting into a space between said platform and a bottom wall of said base,

said contacts having terminal portions projecting from said bottom wall together with expansible sleeves integral with said bottom wall,

a cover secured to said base having a jack receiving opening communicating with said space.

4,202,594

RF CONNECTOR ASSEMBLY INCLUDING MOUNTING APPARATUS FOR A WASHER-LIKE CAPACITOR

Clyde F. Coleman, Crawfordsville, and Myron C. Stewart, Coatesville, both of Ind., assignors to RCA Corporation, New York, N.Y.

Filed Dec. 15, 1978, Ser. No. 969,782
Int. Cl.[2] H01R *3/06*
U.S. Cl. 339—147 R **9 Claims**

1. In an RF connector assembly having an inner conductor and a coaxial tube-like outer conductor and adapted for receiving a washer-like capacitor, said capacitor having a conductive electrode on each of the opposing major flat surfaces thereof, one of said electrodes being electrically connected to said outer conductor and the other of said electrodes being adapted for electrical connection to a utilization device, said capacitor being fitted over said outer conductor for providing DC and low frequency isolation between said outer conductor and said utilization device, the improvement comprising:

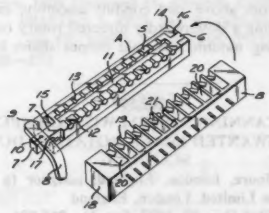
holder means fitted over said outer conductor and adapted for receiving said washer-like capacitor.

4,202,595

ELECTRICAL CONNECTOR

Hiromasa Inouye, Musashino; Tomonari Otsuki, and Tsukasa Saito, both of Tokyo, all of Japan, assignors to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Jun. 12, 1978, Ser. No. 914,597
Claims priority, application Japan, Jun. 14, 1977, 52-76677
Int. Cl.[2] H01R *13/36*
U.S. Cl. 339—174 **8 Claims**



1. An electrical connector for removable connection with a plurality of spaced conductors in a flat strip, said connector comprising: housing means; a plurality of contact means in said housing means, said contact means each including a resilient

contact portion which has a beveled surface; and conductor supporting means movable relative to said housing means between an insertion position in which spaced conductors are to be located onto said conductor supporting means and a clamping position in which said spaced conductors are forced against said beveled surfaces of said contact means, said contact means and said conductor supporting means defining a plurality of conductor receiving passageways, with said beveled surfaces of said plurality of contact means being disposed in said passageways for varying the width of said passageways and for exerting resilient forces against said conductors, said passageways extending generally perpendicular to the direction of said relative movement between said conductor supporting means and said housing means and perpendicular to a plane passing through the beveled surfaces of said contact means, whereby said relative movement of said supporting means from said insertion position to said clamping position decreases the size of each of said passageways and thereby increases the resilient forces between said conductors and the beveled surfaces of said contact means.

4,202,596

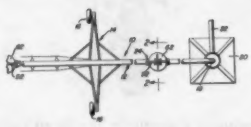
CENTER PIVOT IRRIGATION SYSTEM WITH SLINGER-TYPE SPRINKLER MEANS

Leland F. Knudsen, 303 S. 17th St., Norfolk, Nebr. 68701

Filed Dec. 27, 1977, Ser. No. 864,261

Int. Cl.[2] B05B *3/12*

U.S. Cl. 239—177 **7 Claims**



1. A mobile irrigation system including an elongated horizontal water conduit assembly including support means spaced therealong adapted to be engaged with and to be advanced over the ground for support of said assembly from the ground and lateral advancement thereover, one end of said assembly being adapted for communication with a source of water under low pressure, a plurality of discharge pipes supported from said assembly at points spaced therealong and opening upwardly and outwardly from the interior of said conduit assembly, a plurality of motor driven generally horizontal and centrally apertured discs journalled from said assembly and upwardly through whose central apertures said discharge pipes project for discharging low pressure water outwardly onto the upper surfaces of said discs outwardly of said central apertures, said discs including upstanding water slinger vanes spaced thereabout for engaging and angularly accelerating the water discharged onto said discs, said vanes including outer end portions from which the accelerated water may be discharged at high velocity, said conduit assembly including a plurality of pipe saddles mounted thereon upwardly through which said discharge pipes project, each of said saddles supporting a motor therefrom above said conduit assembly, each of said motors including a downwardly directed rotary output shaft, said discs being mounted on said output shafts for rotation therewith.

4,202,597

OPTICAL SCANNING SYSTEM WITH COMPENSATION FOR UNWANTED IMAGE ROTATION DURING SCANNING

William T. Moore, London, England, assignor to The Rank Organisation Limited, London, England

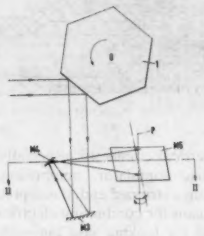
Filed Dec. 30, 1977, Ser. No. 865,781

Claims priority, application United Kingdom, Jan. 7, 1977, 537/77

Int. Cl.[2] G02B *27/17*

U.S. Cl. 350—6.6 **5 Claims**

1. An optical scanning system comprising an azimuth scanning element having a plurality of plane reflecting faces driven in rotation successively to receive a beam of radiation representing a scene being scanned, optical coupling means including a concave mirror receiving the beam from the azimuth scanning element, and an elevation scanning element comprising an oscillating plane mirror receiving the beam from the optical coupling means, said oscillating plane mirror being positioned at substantially the same optical path length from the concave mirror as the azimuth scanning element, wherein the axis of the concave mirror is slightly inclined to the axis of



the beam incident thereon, whereby the image produced by said concave mirror is rotated during scanning in a manner such that said image is seen by the oscillating plane mirror as a curved image, and wherein the axis of oscillation of the oscillating plane mirror is inclined at a small angle to the plane of said plane mirror to scan said curved image, said small angle being selected to produce an image rotation during scanning which is substantially equal and opposite to the image rotation produced during scanning by the slightly inclined axis concave mirror.

4,202,598

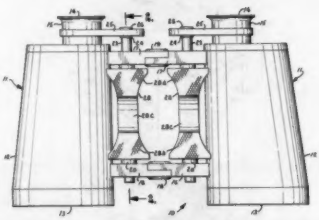
BINOCULARS WITH INDIVIDUAL QUICK FOCUSING EYEPIECES

Albert R. Jenkins, 10267 Houser, Lenexa, Kans. 66215

Filed Oct. 10, 1978, Ser. No. 950,007

Int. Cl.[2] G02B *23/00, 7/06*

U.S. Cl. 350—36 **8 Claims**



1. A binocular device comprising:

a pair of telescopes each having a body portion and an associated optical element, said body portions being coupled together in a manner permitting adjustment of the distance between said optical elements to adjust the interpupillary spacing;

means mounting said optical elements for movement generally toward and away from the respective body portions to optically adjust said elements; and

an adjustment mechanism operable to effect individual movement of each optical element relative to the corresponding body portion separately and independently of the other optical element, thereby permitting each of said optical elements to be optically adjusted in an independent manner;

wherein said adjustment mechanism includes a lever for

each optical element, said levers being disposed between and in proximity to the respective body portions at locations accessible to the fingers when said body portions are held in the hands, said levers being engageable by the fingers to effect individual movement of the respective optical elements relative to the corresponding body portions.

4,202,599

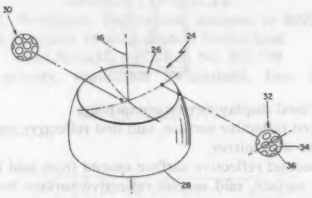
NONUNIFORM IMAGING

Christopher H. Tosswill, Sturbridge, Mass., assignor to Galileo Electro-Optics Corporation, Sturbridge, Mass.

Continuation-in-part of Ser. No. 706,457, Jul. 19, 1976, Pat. No. 4,099,833, which is a continuation of Ser. No. 449,520, Mar. 8, 1974, abandoned. This application Feb. 27, 1978, Ser. No. 881,399

Int. Cl.[2] G02B *5/16*

U.S. Cl. 350—96.25 **2 Claims**



1. A fiber optic device for nonuniformly magnifying or diminishing an image, said device comprising a segment of a heat-drawn tapered bundle of optical fibers, said fibers terminating at each of two end surfaces and varying in cross-sectional area between said end surfaces, the relative amount of said variation in fiber cross-sectional area between said end surfaces being nonuniform among said fibers, one of said end surfaces cut along a surface intersecting the tapered portion of said bundle and being in other than a plane normal to the longitudinal axis of said bundle, and said device having been deformed to change the shape of said end surfaces to be planar and parallel to each other and perpendicular to the longitudinal axis of the bundle.

4,202,600

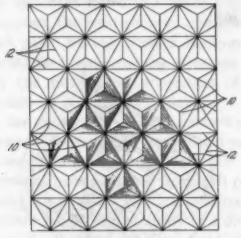
DICED RETROREFLECTIVE SHEETING

Thomas F. Burke, Wayland, and Donald H. Walker, Winchester, both of Mass., assignors to Avery International Corporation, San Marino, Calif.

Filed Apr. 24, 1978, Ser. No. 899,311

Int. Cl.[2] G02B *5/122*

U.S. Cl. 350—103 **14 Claims**



1. In cube-corner retroreflective sheeting comprising a carrier sheet having a layer of cube corner retroreflective prisms disposed over one of its surfaces, the improvement wherein:

the sheeting comprises a plurality of zones of prisms, the prisms being disposed in an ordered array within each zone, the arrays of prisms in adjacent zones having differing azimuthal orientation, whereby adjacent zones have differing retroreflective brightness at high angles of incidence of an incident light beam, and

the zones of prisms have a size such that they are not visually resolvable by the unaided human eye at a minimum expected viewing distance, whereby the sheeting presents an appearance of uniform brightness to the eye when viewed at a high angle of incidence by retroreflected light from a distance of at least the minimum expected viewing distance.

4,202,601

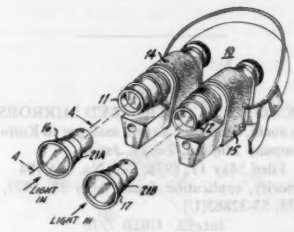
TRAINING AID FOR USE WITH NIGHT VISION APPARATUS

James H. Burbo, and Louis P. Hartman, both of Roanoke, Va., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Apr. 26, 1978, Ser. No. 900,100

Int. Cl.[2] G02C *7/12*; G02B *5/30*

U.S. Cl. 350—159 **14 Claims**



1. In a night vision device of the type employing image intensification between an input and an output port, with said output port adapted to direct an image to the eye of a user, in combination therewith apparatus for controlling the amount of ambient light reaching said output port to enable a user to employ said night vision device in daylight conditions to aid in training the user in operation of said device under conditions prevalent in nightime operations, comprising:

a housing having an internal hollow located between a light input port and a light output port, and means for coupling said housing to said input port of said night vision device,

a variable density filter located in said hollow of said housing and capable when varied of reducing the ambient light reaching said output port according to said variation to thereby enable a user to accurately simulate nightime conditions during typical daylight conditions according to said density filter.

4,202,602

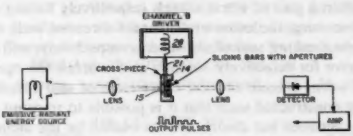
MULTI-ANGULAR RADIANT ENERGY MODULATOR

Ismael Torres, 1800 Piedmont St., Oxnard, Calif. 93030

Filed Dec. 3, 1973, Ser. No. 421,014

Int. Cl.[2] G05D *25/00*; F01B *25/02*

U.S. Cl. 350—272 **7 Claims**



1. An electro-mechanical radiant energy source modulator comprising:

(a) a radiant energy source;

(b) a modulation means having a central aperture mounted in

the path of a radiant energy beam from said source by which said radiant energy beam is to be modulated as it passes therethrough;

(c) a plurality of beam modulating means mounted radially about said central aperture;

(d) a plurality of driver means equal in number to said beam modulating means, a respective driver means connected to each one of said plurality of beam modulating means;

(e) said driver means each being excited by sepatate respective input signals to cause each said beam modulating means to obstruct or permit said radiant energy beam to pass through said central aperture, the overall pulse shape of said radiant energy allowed to pass through said central aperture being governed by a combination of the overall action of all of said beam modulating means in response to each of said input signal operated driver means; and

(f) each said beam modulating means comprising a sliding bar having an aperture therein, the center of each respective sliding bar aperture being normally aligned with said central aperture when the respective driver means connected to the beam modulating means is not excited.

4,202,603

REMOTELY CONTROLLED MIRRORS

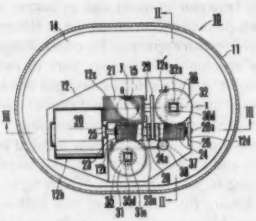
Shizuya Miyauchi, Shizuoka, Japan, assignor to Koito Manufacturing Company Limited, Tokyo, Japan

Filed May 11, 1978, Ser. No. 904,754

Claims priority, application Japan, May 31, 1977, 52-63516; May 15, 1978, 53-32883[U]

Int. Cl.[2] G02B 7/18

U.S. Cl. 350—289 **16 Claims**



1. A remotely controlled mirror comprising a stationary base plate contained in a mirror housing; a back plate provided at the back of a mirror and provided with a supporting mechanism that can tilt in any direction with respect to said base plate; a pair of threaded rods with one ends rotatably and tiltably connected to said base plate; spring means with one end thereof being supported by said base plate and engaging with the threads of said threaded rods while the other end being free, thereby controlling axial movements thereof; means for limiting the axial movement of the spring means that is caused by the rotation of the threaded rods engaging with the spring member; a pair of worm wheels respectively having openings for receiving the other ends of said threaded rods; a pair of worms meshing said worm wheels respectively; and a source of drive for selectively rotating said worms; the openings of said worm wheels and the other ends of said threaded rods being constructed such that it is possible to transmit a torque there between but absorb stresses caused by the inclination of said mirror and acting between said worms and said worm wheels, and said threaded rods being rotated and moved in the axial direction with respect to said spring means by the torque applied thereto from said source of drive through said worm wheels.

4,202,604

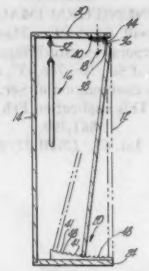
DECORATIVE OPTICAL DEVICE

Lenore S. Kent, 28057 S. Harwich Dr., Farmington Hills, Mich. 48018, and John D. Straub, 20030 Tireman, Detroit, Mich. 48228

Filed Sep. 6, 1977, Ser. No. 830,431

Int. Cl.[2] G02B 5/08

U.S. Cl. 350—291 **6 Claims**



1. A visual display device comprising;

(a) a first reflective surface, said first reflective surface being a one-way mirror,

(b) a second reflective surface spaced from said first reflective surface, said second reflective surface being a two-way mirror;

(c) an illumination means disposed between the first and second reflective surfaces, the illumination of the illumination means being reflected off of the reflective surfaces, and

(d) means for incrementally rotating at least one of the reflective surfaces comprising;

1. a hinge, connected to one of the first and second reflective surfaces, the one reflective surface associated therewith being movable in a horizontal plane thereabout,
2. a vertically extending shaft interconnected to the hinge, the one reflective surface being rotatable in a vertical plane therearound, and
3. a grooved upstanding member, the grooves being dimensioned to seat the bottom of the one reflective surface therewithin and to inhibit movement of the seated reflective surface.

4,202,605

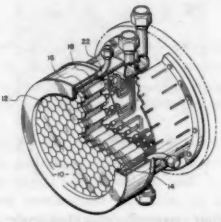
ACTIVE SEGMENTED MIRROR

Theodore A. Heinz, Moorpark, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Apr. 5, 1979, Ser. No. 27,208

Int. Cl.[2] G02B 7/18

U.S. Cl. 350—292 **11 Claims**



1. An active segmented mirror for making static and dynamic wavefront corrections, comprises:

a plurality of mirror element assemblies, wherein each of said assembly further comprises:

a mirror surface;

a cooled mirror substrate, for supporting said mirror surface;

a complaint joint, connecting said mirror substrate with a support structure for permitting tip, tilt and planar translation;

a strut connecting said mirror substrate with an actuator assembly for providing coolant passages;

an actuator assembly, connected through said strut to said mirror substrate for driving said mirror element; and a support structure for mating said mirror element assemblies.

4,202,606

LIQUID CRYSTAL DISPLAY HAVING INTEGRATED BRIDGE CONTACTS

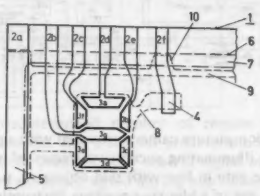
Peter Wild, Wettingen, Switzerland, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Nov. 15, 1977, Ser. No. 851,779

Claims priority, application Switzerland, Dec. 9, 1976, 15488/76

Int. Cl.² G02F 1/13

U.S. Cl. 350—336 **4 Claims**



1. In a liquid crystal display for displaying plural display characters, said display having front and rear glass plates separated by a cell sealing bar, with a liquid crystal layer provided between said plates and retained therebetween by said sealing bar to form a liquid crystal cell, the rear cell plate having a plurality of common electrodes formed thereon, each common electrode corresponding to a respective display character, the front cell plate having plural display electrode segments formed thereon corresponding to respective display characters, said front cell plate having plural contact points for making electrical connection to respective display segments and a contact point for making electrical connection to said common electrodes on said rear cell plate by means of a plate interconnection formed in a predetermined portion of said cell, wherein for a particular application selected of said contact points are to be interconnected, the improvement comprising:

said rear cell plate having formed thereon a conductive bridge connection path having portions thereof overlapped by the orthogonal projection of said selected contact points on said rear cell plate;

said sealing bar contacting all said contact points and disposed between at least said overlapped portions of said bridge connection path on the rear cell plate and said selected contact points on said front cell plate;

said cell sealing bar having a selected unidirectional conductivity presenting high conductivity in a direction perpendicular to said cell plates and low lateral conductivity in a direction parallel to said plates;

said sealing bar contacting the overlapped portions of the selected front cell plate contact points and said bridge connection path such that said selected contact points are electrically interconnected through said sealing bar and said bridge connection path.

4,202,607

MIRROR WITH INFORMATION DISPLAY

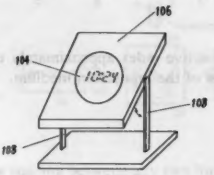
Isamu Washizuka, Kyoto; Satoshi Teramura, Kashiwara, and Masanori Matsuishi, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

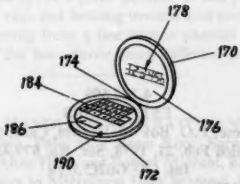
Continuation of Ser. No. 667,620, Mar. 17, 1976, abandoned. This application Feb. 9, 1978, Ser. No. 876,244

Claims priority, application Japan, Mar. 17, 1975, 50-32652; Apr. 15, 1975, 50-46229; May 23, 1975, 50-62730; Jun. 3, 1975, 50-75678; Aug. 7, 1975, 50-109852

Int. Cl.² G02F 1/13

U.S. Cl. 350—338 **18 Claims**





1. A selectively operable mirror and digital information display combination, comprising:

a front glass window having a reflection film on the rear surface thereof to form a mirror of a predetermined height;

a digital information display behind the front glass window for displaying characters of predetermined heights through the front glass window, said digital information display including a liquid crystal display unit of the reflection type, said reflection film being removed at a position where said liquid crystal display unit is attached;

said predetermined height of said mirror being at least several times higher than the height of said characters; and

a mode selection switch provided for enabling said digit information display to operate said combination in a display mode and disabling said digit information display to operate said combination in a mirror mode.

4,202,608

INSTRUMENT HAVING A LIQUID CRYSTAL DISPLAY

Meinolph Kaufmann, Fislisbach, Switzerland, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Apr. 10, 1978, Ser. No. 895,130

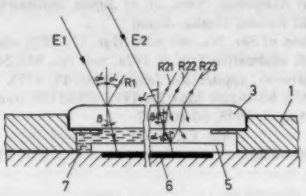
Claims priority, application Switzerland, Jul. 26, 1977, 9211/77

Int. Cl.² G02F 1/13

U.S. Cl. 350—339 R **6 Claims**

1. In an instrument having a liquid crystal display disposed behind a glass cover and separated from said glass cover by a hollow space filled with an immersion medium, the improvement comprising:

said immersion medium containing a substance imparting thixotropic properties to said medium, said substance



having a refractive index approximately equal to the refractive index of the immersion medium.

4,202,609

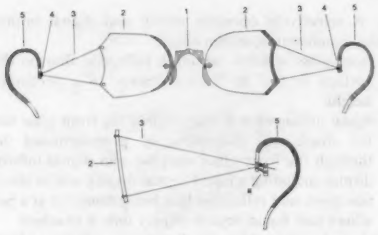
EYEGLASSES

Donald M. Reese, P.O. Box 10, Darwin, Calif. 93522

Filed Feb. 21, 1978, Ser. No. 879,459

Int. Cl.[2] **G02C** *5/14*

U.S. Cl. 351—111 **13 Claims**



1. An improved eyeglasses and support combination which comprises:

a first transparent member and a second transparent member attached to the first transparent member, the combined first and second transparent members being configured to be disposed in front of a person's eyes in a desired plane substantially parallel with a plane defined by the front surface of the person's eyes;

a first pair of suspension lines attached at two spaced apart points to the first transparent member;

a second pair of suspension lines attached at two spaced apart points to the second transparent member;

first and second earpiece members, each earpiece member being configured to be positioned over and behind a respective ear of the person and attached to a respective pair of suspension lines, and

means for fastening the first and second pair of suspension lines to the respective earpiece members to adjustably position the combined first and second transparent members in said desired plane, a result of said combination being that the combined first and second transparent members are held to occupy said desired plane and are forced to return thereto after an inadvertent dislocation.

4,202,610

MOTION PICTURE CAMERA WITH FADE-IN AND FADE-OUT EFFECTS DURING LONG-TERM EXPOSURE

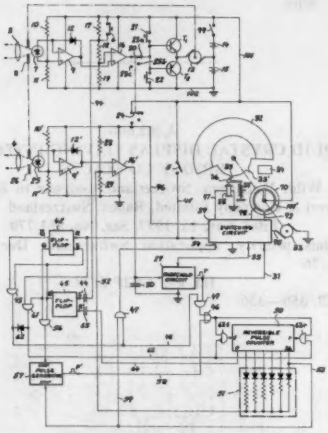
Gerd Kittag, Vienna, Austria, assignor to Karl Vockenhuber and Raimund Hauser, both of Vienna, Austria

Filed Sep. 20, 1978, Ser. No. 943,988

Claims priority, application Switzerland, Sep. 22, 1977, 11588/77

Int. Cl.[2] **G03B** *9/58, 19/18*

U.S. Cl. 352—91 C **14 Claims**



1. In a motion-picture camera provided with a picture-taking objective for illuminating successive frames of a film moving past an image gate in line with said objective, a shutter movable into and out of a blocking position obstructing said image gate, drive means for intermittently transporting the film past said image gate while moving said shutter into its blocking position during advances of the film from one frame to the next, timing means operable to arrest said drive means in an unblocking position of said shutter for a variable exposure period forming part of a shutter cycle, and photometric means operable to control said timing means for varying the duration of said exposure period generally inversely with the intensity of illumination traversing said image gate, said timing means including a storage capacitor and a threshold circuit connected across said storage capacitor for integrating an electrical output variable of said photometric means to emit a pulse terminating said exposure period upon attainment of a capacitor charge corresponding to a reference level established by said threshold circuit,

the combination therewith of fading-control means adapted to be operatively coupled with said timing means for changing the exposure of successive frames between a predetermined maximum value and a predetermined minimum value, said fading-control means comprising a signal generator connectable to said threshold circuit for progressively modifying said reference level to alter said exposure period by discrete increments during successive shutter cycles.

4,202,611

PROJECTOR APPARATUS AND CONTROL ARRANGEMENT

Robert R. Parker, Wheeling, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed Jan. 8, 1979, Ser. No. 2,055

Int. Cl.[2] **G03B** *1/00;* **H04Q** *1/32*

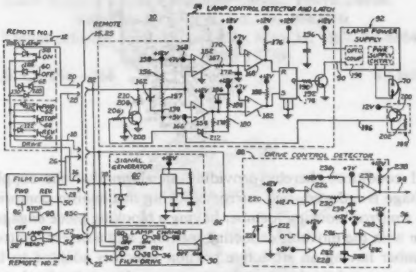
U.S. Cl. 352—179 **31 Claims**

1. A control arrangement for projector apparatus, the projector apparatus including a selective drive control arrange-

ment operable in at least two drive modes and a stop mode, and a selectively operable projector illumination source arrangement, the control arrangement comprising:

a signal generator within said projector apparatus for generating a predetermined waveform;

remote control means responsive to said signal generator and interconnected to said projector apparatus over a first signal generator conductor, a second drive signal control path conductor, and a third illumination source signal control path conductor, said remote control means comprising manually operable remote controls and remote control signal means responsive to said manually operably remote controls and said signal generator for selectively outputting a predetermined control signal in response to operation of each of said manually operable remote controls, said manually operable remote controls comprising



a first predetermined number of remote illumination source controls, and a second predetermined number of remote drive controls, said control signal means outputting a predetermined signal having individually detectable characteristics on said second drive signal control path conductor in response to operation of each of said remote drive controls and outputting a predetermined signal having individually detectable characteristics on said third illumination source signal control path conductor in response to operation of each of said remote illumination source controls; and

means within said projection apparatus and responsive to said predetermined signals on said second drive signal control path conductor and said third illumination source signal control path conductor for controlling the mode of operation of said selective drive control arrangement and said projector illumination source arrangement.

4,202,612

ARRANGEMENT FOR SENSING THE GEOMETRIC CHARACTERISTICS OF AN OBJECT

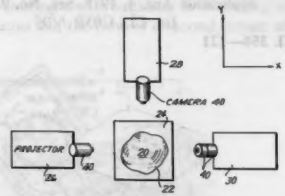
Paul L. Di Matteo, Melville; Joseph A. Ross, Fort Salonga; Howard K. Stern, Greenlawn, and Lawrence Waszak, Coram, all of N.Y., assignors to Solid Photography Inc., Melville, N.Y.

Continuation of Ser. No. 755,036, Dec. 28, 1976, abandoned, which is a continuation-in-part of Ser. No. 608,265, Aug. 27, 1975, abandoned. This application Jun. 6, 1978, Ser. No. 912,959

Int. Cl.[2] **G03B** *21/26, 21/20;* **G01C** *11/12;* **G01B** *11/24*

U.S. Cl. 353—28 **15 Claims**

1. An arrangement for projecting a plurality of parallel lines onto a surface comprising in combination: a source of electromagnetic radiations; said lines having a spacing independent of the distance to said surface from said source; means with focal point for condensing radiated energy rays from said source and focusing them to a condensed bundle onto a plane containing the focal point of said condensing means; projecting means having a focal point coinciding with the focal point of said condensing means, energy rays leaving said projecting means being substantially parallel in one direction; and mask means between said condenser means and the focal point thereof, said mask means carrying lines parallel to each other and to be projected onto said surface; planes containing said energy rays between said projecting means and said surface being parallel to each other, lines on said mask means being projected by said projecting means as parallel elements spaced from each other independent of distance of points on said surface from said



mask means; the spacing between any two lines, being constant along the distance between said projecting means and said surface and independent of the magnitude of said distance; an observer with an eye in a plane parallel to said planes containing said energy rays and looking toward said projecting means seeing light coming from a line source parallel to said plane; the location of the line source being different for each plane.

4,202,613

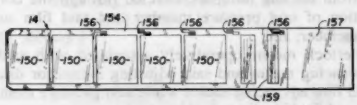
FILM STRIP HANDLING APPARATUS AND METHOD

James O. Haning, Palo Alto; Bram Kool, Saratoga; Jules G. Moritz, Los Altos Hills, and Robert Mizrahi, El Cerrito, all of Calif., assignors to Microform Data Systems, Inc., Mountain View, Calif.

Continuation of Ser. No. 785,981, Apr. 8, 1977, abandoned, which is a division of Ser. No. 646,133, Jan. 2, 1976, Pat. No. 4,053,215, which is a division of Ser. No. 536,510, Dec. 26, 1974, Pat. No. 3,963,336, which is a division of Ser. No. 313,902, Dec. 11, 1972, Pat. No. 3,909,122, which is a division of Ser. No. 101,224, Dec. 24, 1970, Pat. No. 3,743,400. This application Sep. 5, 1978, Ser. No. 939,593

Int. Cl.[2] **G03B** *21/00*

U.S. Cl. 353—120 **2 Claims**



1. A record medium comprising: a film strip having a central region, a side margin between the central region and one side edge of the film strip, and a plurality of segments disposed in end-to-end relationship in the central region, each segment having a number of image frames, said film strip having a code area for each segment, respectively, each code area being in the side margin and having a number of code regions extending laterally of the side margin, there being a first code region near the respective segment, a second code region near the side edge of the film strip, and a number of third regions between the first and second regions, each of said first and second regions having a code band, the code band of the first region having an end laterally aligned with the end of the code band of the second region with the code bands of the first and second bands being on opposite sides of a line passing through said aligned ends of the code bands, each third code region being capable of receiving a code band, having a length equal to the sum of the lengths of the code bands in the first and second regions, each code band being capable of being sensed as the film strip moves with respect to a predetermined reference,

there being at least one code band at a third code region of each code area, respectively.

4,202,614

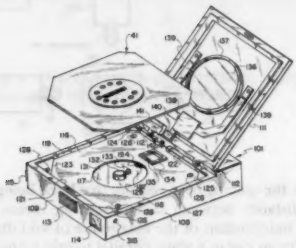
PHOTOGRAPHIC CAMERAS

Donald M. Harvey, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 774,715, Mar. 7, 1977, abandoned. This application Aug. 4, 1978, Ser. No. 931,076

Int. Cl.[2] **G03B** *1/00*

U.S. Cl. 354—121 **18 Claims**



1. A camera adapted to receive a film cartridge assembly, the assembly including a generally flat casing enclosing a film disk and having an obverse wall including an exposure window, said camera comprising:

a. film advancing means for imparting rotational movement to a film disk within a film cartridge assembly received by said camera to bring successive exposure areas of the film disk into alignment with the exposure window;

b. a film support member adapted to enter the exposure window of the received film cartridge assembly;

c. a pressure member adapted to engage the received film cartridge assembly;

d. adjusting means for selectively adjusting said pressure member relative to said film support member to:

(1) a first condition in which said pressure member and said film support member cooperate to cause the film disk to be held with the film disk exposure area aligned with the exposure window located in a predetermined film exposure plane, and to

(2) a second condition in which the film disk is released from holding influence effected through the cooperation of said pressure member and said film support member; and

e. interlock means operatively associated with said film advancing means and said adjusting means for disabling said film advancing means while said pressure member is in said first condition.

4,202,615

SINGLE LENS REFLEX CAMERA WITH ELECTRICAL SHUTTER

Kazuyuki Nemoto, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Japan

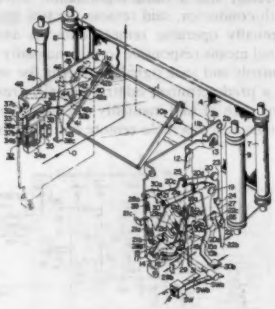
Filed Dec. 4, 1978, Ser. No. 966,359

Claims priority, application Japan, Dec. 28, 1977, 52/159976

Int. Cl.[2] **G03B** *19/12, 9/08, 9/64*

U.S. Cl. 354—152 **10 Claims**

1. A single lens reflex camera with electrical shutter comprising a power supply which is used to operate said camera electrically, an electromagnet assembly coupled to said power supply and assuming a first condition whenever the supply voltage of said power supply is above a given level which is required for a normal operation of said camera and a second condition when the supply voltage is below said given level, a movable reflecting mirror and means responsive to a shutter release operation for moving said mirror in a first direction and for operating a shutter of the camera at the termination of the movement of said reflecting mirror in said first direction, and a mirror blocking mechanism controlled by the electromagnet assembly for permitting movement of the movable reflecting mirror in said first direction when the electromagnet assembly assumes said first condition and for blocking the movable reflecting mirror in the course of its movement in said first direction when the electromagnet assembly assumes said second condition, thereby providing an alarm that the supply voltage is reduced, said mirror blocking mechanism comprising a mirror blocking member having a blocking piece engageable with the movable reflecting member, and a detent control member having an attractive portion which is adapted to be held attracted to the electromagnet assembly and a hook engageable with the mirror blocking member when said attractive portion is displaced from said electromagnet assembly.



4,202,616

FILM-TRANSPORT SYSTEM FOR PHOTOGRAPHIC STILL CAMERA

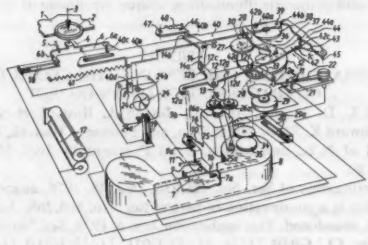
Otto Stemme, Munich; Rolf Schröder, Baldham; Peter Lermann, Narring, and Horst Karl, Munich, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Fed. Rep. of Germany

Filed Sep. 5, 1978, Ser. No. 939,374

Claims priority, application Fed. Rep. of Germany, Sep. 5, 1977, 2739930

Int. Cl.[2] **G03B** *1/18, 17/26, 1/00*

U.S. Cl. 354—173 **24 Claims**



6. In a photographic still camera, a film-transport system transporting film of the type whose frames are provided with perforations, including a shutter unit having a triggerable set state and a triggered unset state; an electric film-transport and shutter-setting motor; motor-control switch means having a motor-energize state and a motor-deenergize state; and a control mechanism establishing at least one of said states, the control mechanism including a perforation feeler mounted for entry into and retraction from film perforations, a control member mounted for movement in a first direction from a first

to a second position and in an opposite second direction back to the first position, drive spring means urging the control member in the first direction, a user-activated trigger mechanism serving when unactivated to prevent movement of the control member in the first direction, the trigger mechanism when activated not preventing such movement, and a motion-transmitting structure responding to the reaching of the second position by coupling the motor to the control member in a sense causing the latter to be returned by the motor back to the first position.

4,202,617

SHUTTER RELEASE SECURITY DEVICE IN MOTOR DRIVE CAMERA

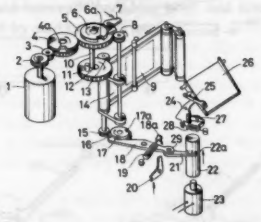
Fumio Urano, Omiya; Akihiro Arai, Urawa; Takumi Kobayashi, and Junji Umetsu, both of Tokyo, all of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 17, 1978, Ser. No. 906,804

Claims priority, application Japan, May 31, 1977, 52-63547

Int. Cl.[2] G03B *17/38*

U.S. Cl. 354—268 **4 Claims**



1. In a camera having a manually operable shutter release member, a mirror, a mirror locking releasing member for releasing said mirror to carry out shutter release and a motor drive means for directly operating said mirror locking releasing member, the improvement comprising:

a shutter release security device for preventing shutter release during film winding, said security device comprising an operation locking member movable between a first position, said locking member preventing movement of said mirror locking releasing member whenever said locking member is in its first position, and a second position, in which it is disengaged from said mirror locking releasing member to permit operation of the latter by said motor drive unit, and a control means for maintaining said operation locking member in its first position during film winding and moving said operation locking member to its second position at the completion of film winding.

4,202,618

ELECTROSTATIC COPYING MACHINE HAVING FLASH-DISCHARGE-LAMP FIXING UNIT

Fritz Waschk, Unterhaching; Heinz Webersik, Munich, and Rudolf Schinagl, Unterhaching, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Fed. Rep. of Germany

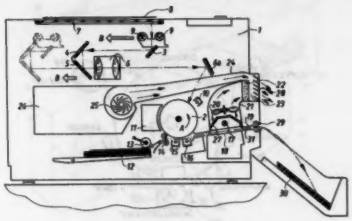
Filed Dec. 30, 1977, Ser. No. 866,658

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1977, 2750485

Int. Cl.[2] G03G *15/00;* G03B *27/52*

U.S. Cl. 355—3 FU **4 Claims**

1. An improved electrostatic copying machine of the type provided with a fixing station comprising a reflector and means including a flash lamp located within the reflector for fusing a toner image on a copying medium by applying thereto at least one brief high-energy flash of radiant energy to raise the temperature of the toner to its melting point, the improvement comprising means defining a cooling-air passage in the machine, the cooling-air passage including the space surrounding the reflector and flash lamp; and filter means provided in the cooling-air passage downstream of the reflector and flash lamp for removing from cooling air flowing through the cooling-air passage contaminants picked up in the vicinity of the reflector and flash lamp, said cooling-air passage being a first cooling-air passage, furthermore comprising means defining a second cooling-air passage extending through a different part of the interior of the copying machine, means establishing the flow of a first stream of cooling air through the first cooling-air passage and filter means and the flow of a second stream of cool-



ing air through the second cooling-air passage of greater volumetric flow rate than the first stream of cooling air, and means at the downstream ends of the first and second cooling-air passages for effecting the discharge of cooling air from the cooling-air passage to the exterior of the copying machine and preliminary to such discharge the mixing together of the first and second streams of cooling air, to thereby dilute the first stream of cooling air by mixing the latter into the higher-volumetric-flow-rate second stream of cooling air prior to discharge.

4,202,619

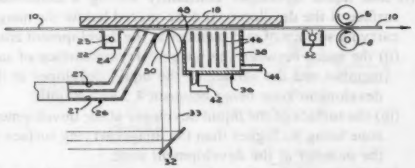
ELECTROPHOTOGRAPHIC APPARATUS

John D. Plumadore, 83 Woodside Ter., Westfield, Mass. 01085

Filed Aug. 31, 1978, Ser. No. 938,695

Int. Cl.[2] G03G *15/00, 15/10*

U.S. Cl. 355—3 P **16 Claims**



1. Electrophotographic apparatus comprising means for advancing a film strip having a photoconductive layer along a given path, means for electrostatically charging said photoconductive layer, an optical system for imaging and exposing the charge on said layer with monochromatic light, said optical system including a short focal length optical gate having a longitudinal axis disposed transversely of said path for surface engagement with the film strip being moved thereby, means for wetting the contiguous surface of the film and optical gate with a hydrocarbon based optical liquid during exposure of said film and a toning head for applying an electrophoretic liquid to the electrically imaged film for developing a visual image thereon.

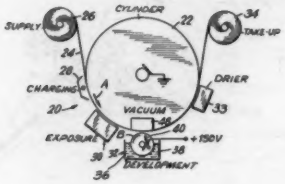
4,202,620
APPARATUS FOR LIQUID DEVELOPMENT OF LATENT ELECTROSTATIC IMAGES

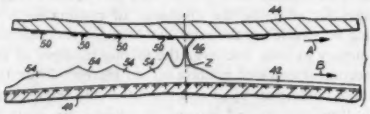
Irving L. Klavan, Teaneck; Peter J. Calabrese, Maywood; Theron R. Finch, Northvale; Arthur Greenberg, Teaneck, all of N.J., and Robert P. McElroy, Spring Valley, N.Y., assignors to Philip A. Hunt Chemical Corp., Palisades Park, N.J.

Continuation-in-part of Ser. No. 676,463, Apr. 13, 1976, abandoned. This application Jun. 29, 1978, Ser. No. 916,041

Int. Cl.[2] G03G *15/10*

U.S. Cl. 355—10 21 Claims





1. An apparatus for developing a latent electrostatic image, said apparatus comprising:

(A) a member having a smooth surface capable of having an electrostatically charged image applied thereto,

(B) means to apply a latent electrostatic charge image to said surface of said member,

(C) a development zone,

(D) means to move said surface of said member with said image thereon to and past the development zone, and

(E) means to provide a liquid developer with a smooth surface at the development zone,

(i) said liquid developer constantly having a continuous surface at the development zone spaced below the image-carrying surface of said member at the development zone,

(ii) the space between the image-carrying surface of said member and the surface of the liquid developer at the develoment zone being between 4.5 and 40 mils,

(iii) the surface of the liquid developer at the development zone being no higher than the imagecarrying surface of the member at the development zone,

(iv) the liquid developer having a viscosity of 0.5 to 50 centipoises, a surface tension of 20 to 75 dynes/cm, and a density in the order of 1 gram/cc,

(v) the latent electrostatic image having a surface potential of at least 100 volts,

(F) such that portions of the surface of the liquid developer at the development zone opposed to charged segments of the image jet toward said segments as pseudopods from which the liquid at the tips of the pseudopods form droplets on the charged segments which remain on said member, while liquids in any pseudopods formed in opposition to uncharged segments at the development zone are prevented from reaching the uncharged segments by the force of gravity.

4,202,621
RECORDING DEVICE

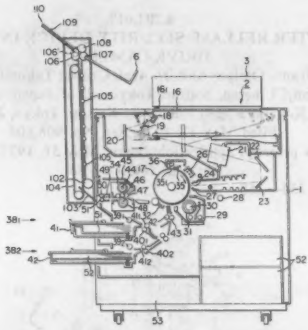
Shigeru Yoshimura, Yokohama, and Katsuichi Shimizu, Hoya, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

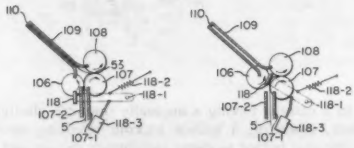
Filed May 31, 1978, Ser. No. 911,141

Claims priority, application Japan, Jun. 3, 1977, 52/65416; Jun. 14, 1977, 52/70074; Jun. 27, 1977, 52/76391

Int. Cl.[2] G03G *15/00*

U.S. Cl. 355—14 R 41 Claims





6. A recording device comprising:

(a) image forming means to form a visible image on a recording medium in a flexible sheet;

(b) transfer means which transfers the sheet recording medium, on which the visible image has been formed by said image forming means;

(c) first discharge means which folds the imaged sheet recording medium in half, and discharges the same out of the device;

(d) second discharge means which discharges said imaged sheet recording medium without folding the same; and

(e) selection means to select whether said sheet recording medium transferred by said transfer means is to be introduced into said first discharge means, or into said second discharge means.

4,202,622
DIGITALLY CONTROLLED IMAGE FORMING APPARATUS

Yoshihiro Kawatsura, Kawasaki; Katsuichi Shimizu, Hoya, and Hisashi Sakamaki, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 30, 1978, Ser. No. 891,852

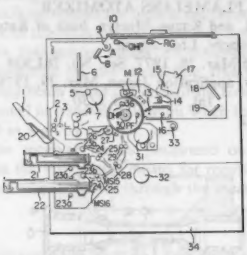
Claims priority, application Japan, Apr. 6, 1977, 52/39857; Apr. 6, 1977, 52/39858

Int. Cl.[2] G03G *15/00*

U.S. Cl. 355—14 C 5 Claims

1. An image forming apparatus comprising a recording member, elements operable for forming an image on said recording member, means for detecting the operational state of the apparatus and for providing detection signals related thereto, and a digital control means provided with a stored main program for actuating said elements for image formation, said digital control means comprising a stored interrupt pro-

gram to be executed upon interruption of the execution of said stored main program, an input port for receiving signals for causing execution of said interrupt program, and means for enabling the execution of said interrupt program only after a



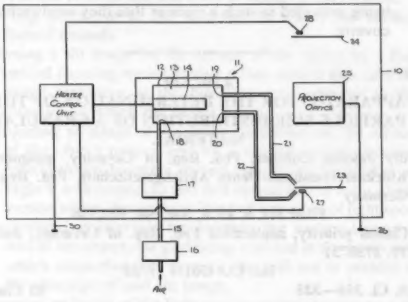
predetermined operational state of at least one of said elements is reached, and said detecting means being connected to said input port to cause, in response to the detection signals, the execution of said interrupt program after said interrupt program is enabled by said enabling means.

4,202,623

TEMPERATURE COMPENSATED ALIGNMENT SYSTEM

Theodore Watkin, Stamford, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Jan. 8, 1979, Ser. No. 1,991
Int. Cl.[2] G03B *27/52*
U.S. Cl. 355—30 **15 Claims**



1. In a projection system for exposing a silicon wafer to circuit patterns on a mask by optically projecting the circuit patterns onto the wafer, apparatus for correction misalignment between the mask and wafer due to changes in dimension of the mask or wafer due to temperature comprising,

first means for viewing the projection of the mask on the wafer,

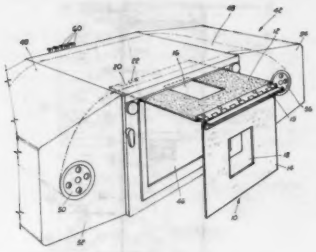
second means for aligning the viewed mask and wafer to a predetermined standard by adjusting the temperature of the mask or wafer.

4,202,624

MASKING DEVICE FOR CROPPING PHOTOGRAPHS VIEWED ON A VIEW SCREEN OF A PHOTOGRAPHIC PRINTER

Vivian D. Krehbiel, Wichita, Kans., assignor to Kreonite Inc., Wichita, Kans.

Filed Sep. 15, 1978, Ser. No. 942,873
Int. Cl.[2] G03B *17/02, 13/28, 27/58*
U.S. Cl. 355—45 **7 Claims**



1. A masking device for cropping a photograph seen through a viewing screen in a photographic printer, the masking device comprising;

a first flat opaque frame having an aperture in the center thereof, said first frame adapted for receipt in front of the photographic paper disposed in the printer; and

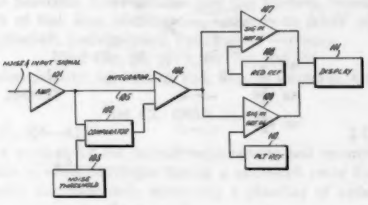
a second flat frame attached to said first frame and having an aperature at the center thereof, the size of the aperture in said first frame corresponding to the aperture in said second frame, said second frame adapted for receipt in the front of the viewing screen of the photographic printer.

4,202,625

METHOD AND APPARATUS FOR DISCRIMINATING RED BLOOD CELLS FROM PLATELETS

Irving L. Weiner, Sharon, and Russell J. Gershman, both of Middleboro, Mass., assignors to Ortho Diagnostics, Inc., Raritan, N.J.

Filed Aug. 18, 1978, Ser. No. 934,938
Int. Cl.[2] G01N *33/16, 15/02*
U.S. Cl. 356—39 **7 Claims**



1. A method of discriminating platelets from red blood cells comprising the steps of:

passing the cells individually through a light field;

measuring optical scatter produced by passage of cells through the field;

generating a signal representative of said measuring;

discriminating portions of said signal based on amplitude, thereby identifying possible signal representations of cells;

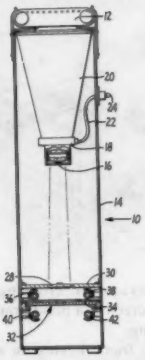
further discriminating among said portions based on area of said portions, larger area portions being deemed red cells, and select smaller area portions being deemed platelets.

4,202,626

SIGNATURE VERIFICATION AND AUTHENTICATION SYSTEMS

George L. Mayer, Jr., New Orleans, La., and John D. Schick, San Francisco, Calif., assignors to A Patent Partnership, New Orleans, La.

Filed Feb. 24, 1978, Ser. No. 880,805
Int. Cl.[2] G03B *27/68*
U.S. Cl. 355—52 **56 Claims**



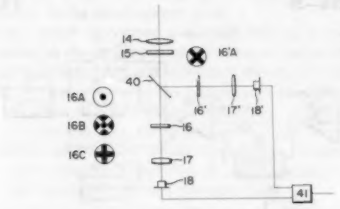
1. A method of signature verification and authentication comprising the step of reproducing on a document a cryptographic representation of at least one property of a signature of an authorized user thereof modified in accordance with at least one indicium identifying said user with said document.

4,202,627

PHOTOELECTRIC DETECTING APPARATUS

Akiyoshi Suzki, Tokyo; Ichiro Kano; Hideki Yoshinari, both of Yokohama; Masao Tozuka, Ohmiya; Ryozo Hiraga, Yokohama; Yuzo Kato, Yokohama, and Yasuo Ogino, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 28, 1978, Ser. No. 900,856
Claims priority, application Japan, May 1, 1977, 52-50606
Int. Cl.[2] G01K *9/08*; G01B *11/00*
U.S. Cl. 356—71 **3 Claims**



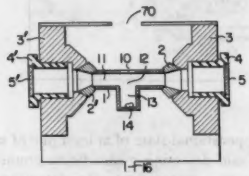
1. A photoelectric detecting apparatus comprising:
a light source;
a scanner for scanning an object to be tested having a pattern which diffracts light in a predetermined direction by a light beam from said light source;
a first photoelectric detector for detecting the diffracted light in the predetermined direction coming from said test object;
a second photoelectric detector for detecting the light diffracted in directions other than said determined direction coming from said test object; and
an electric circuit for producing a signal corresponding to the diffracted light coming from said pattern from the outputs of said first and second photoelectric detectors.

4,202,628

FLAMELESS ATOMIZER

Hideaki Koizumi, and Kazuo Moriya, both of Katsuta, Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 28, 1977, Ser. No. 781,938
Claims priority, application Japan, Mar. 29, 1976, 51-33668
Int. Cl.[2] G01J *3/30*
U.S. Cl. 356—312 **15 Claims**



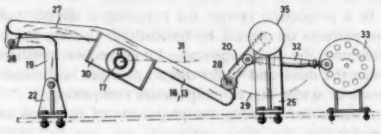
1. A flameless atomizer comprising:
a hollow cuvette including an opening at both ends and a port in a radial direction substantially at its central portion, and made of a conductive material Joule-heated by current flowing theretherethrough, said cuvette being integrally provided with a projection having a recess in the interior thereof at a position situated in a radial direction substantially at its central portion and substantially opposite to said port;
electrodes for supporting said cuvette; and
a device for flowing a protective gas into the interior and exterior of said cuvette, wherein the interior of said cuvette is divided into:
a sample mount section at which a sample introduced through the port of said cuvette is disposed;
a light beam path section through which a light beam passes in said cuvette; and
an absorption cell section at which said light beam path section intersects with atomic vapors generated from the sample disposed in said sample mount section, and a pair of magnets for applying a megnetic field to said absorption cell section limited to a certain area within said cuvette being provided in such a manner that they sandwich said cuvette.

4,202,629

APPARATUS FOR THE DETERMINATION OF THE PARTICLE SIZE DISTRIBUTION OF A GRANULAR MATERIAL

Willy Jakobs, Cologne, Fed. Rep. of Germany, assignor to Klöckner-Humboldt-Deutz Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 6, 1978, Ser. No. 922,338
Claims priority, application Fed. Rep. of Germany, Jul. 7, 1977, 2730731
Int. Cl.[2] G01N *21/26*
U.S. Cl. 356—335 **11 Claims**



1. A scanning apparatus for the determination of a particle size distribution of a granular material in a measuring channel

having radiation permeable side walls and a measuring zone, the granular material being introduced in the measuring channel and distributed according to grain size by a sifting air current, comprising:

a reciprocating measuring frame having a closed loop portion which surrounds the measuring chamber and with all portions of the loop spaced from the chamber;

a radiation transmitter means for producing a measuring beam mounted on the measuring frame such that the measuring beam scans the measuring zone of the measuring channel in transverse fashion when the frame is reciprocated in a given manner; and

a radiation receiver means positioned on the frame and opposite the transmitter means for receiving the measuring beam after it passes through the measuring zone.

4,202,630

METHOD OF AND APPARATUS FOR RECORDING SURFACE IRREGULARITY OF OBJECT

Masane Suzuki, and Kiyoshi Suzuki, both of Omiya, Japan, assignors to Fuji Photo Optical Co., Ltd., Omiya, Japan

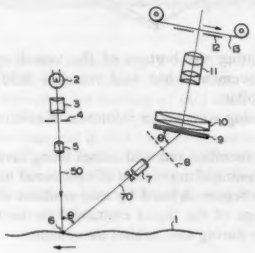
Continuation-in-part of Ser. No. 648,814, Jan. 13, 1976, Pat. No. 4,102,578. This application Feb. 6, 1978, Ser. No. 875,515

Claims priority, application Japan, Jan. 15, 1975, 50-6780

The portion of the term of this patent subsequent to Jul. 25, 1995, has been disclaimed.

Int. Cl.[2] G01B *11/24*

U.S. Cl. 356—371 **11 Claims**



1. A method of recording surface irregularities of a moving object in the form of contour lines comprising the steps of:

feeding an object in the direction in which the surface thereof extends,

forming a slit image on the surface of the object by a first optical focusing means having a first optical axis, said slit image extending in the direction perpendicular to the direction in which the object is fed,

projecting an image of the slit image formed on the surface of the object onto a grid by a second optical focusing optical means having a second optical axis inclined at an angle θ with respect to said first optical axis to form a light section moire element consisting of a number of light spots arranged at intervals representing the surface irregularities of the object, the grid being oriented in the position in which respective slits forming the grid are in parallel to the direction of said slit image,

forming an image of the light section moire element on a slit located adjacent a photographic film through a light spot extending lens means which extends the respective light spots of the light section moire element in the lateral direction so that all the light spots extended are crossed by the slit,

feeding the photographic film in the lateral direction of the slit in synchronization with the movement of the object, and

providing a light deflecting means after said grid to deflect the light passing through the grid to enlarge the light section moire element in the lateral direction.

4,202,631

APPARATUS FOR DETECTING DEFECTS IN PATTERNS

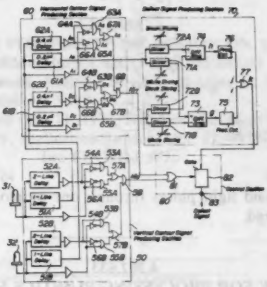
Yasushi Uchiyama, Yokohama, and Daikichi Awamura, Kawasaki, both of Japan, assignors to Nippon Jidoseigyo Ltd., Kawasaki City, Japan

Filed Jul. 5, 1978, Ser. No. 922,217

Claims priority, application Japan, Jul. 14, 1977, 52-83520

Int. Cl.[2] G01B *11/00*

U.S. Cl. 356—394 **24 Claims**



1. An apparatus for detecting defects in patterns, particularly defects in chip patterns of photomasks for use in manufacturing semiconductor integrated circuits comprising

means for optically scanning simultaneously identical portions of two patterns to be compared with each other to produce first and second picture signals each corresponding to a respective one of the scanned pattern portions;

means for receiving at least one of said first and second picture signals and producing a contour signal which represents contour regions having a predetermined width along the pattern contours;

means for receiving said first and second picture signals and forming a difference between these picture signals to produce a defect signal; and

control means for receiving said contour signals and decreasing a defect detection sensitivity in the contour region of the patterns.

4,202,632

PROCESS AND APPARATUS FOR OPTICAL RECORDING OF MOTIONS AND STATES IN ULTRACENTRIFUGES IN MULTI-CELL OPERATION

Walter Maechtle, Ludwigshafen, and Utz Klodwig, Mannheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Oct. 28, 1977, Ser. No. 846,331

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1976, 2649027

Int. Cl.[2] G01N *21/24*

U.S. Cl. 356—427 **2 Claims**

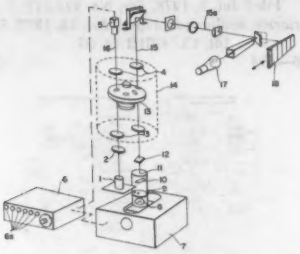
1. A process for the optical measurement and recording of motions in ultracentrifuges having a multi-cell rotor for substantially simultaneously measuring a plurality of cells, said process comprising the steps of:

providing synchronizing pulses in accordance with the rotation of said rotor;

deriving from said synchronizing pulses light pulses of constant energy, said energy being independent of the rotational speed of said rotor within a range of from 100 to 80,000 revolutions per minute.

said light pulses being produced by a gas discharge lamp and said deriving step including linearly charging the capacitor of a saw-tooth generator, and rapidly discharging said capacitor at the end of the time interval between any two successive synchronizing pulses so that the maximum voltage of each saw-tooth of the saw-tooth wave pro-

duced by said generator is constant regardless of the rotor speed within said range, whereby light pulses of constant energy are obtained for said gas discharge lamp; and



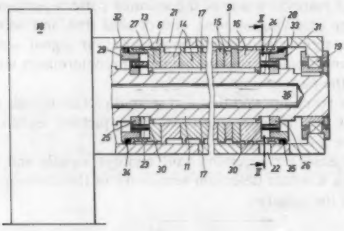
passing said light pulses through one or more cells to be measured.

4,202,633

MACHINE FOR PROCESSING PLASTICS MATERIALS

Dietmar Anders, Hanover, Fed. Rep. of Germany, assignor to Hermann Berstorff Maschinenbau GmbH, Hanover, Fed. Rep. of Germany

Filed Nov. 3, 1978, Ser. No. 938,716
Int. Cl.[2] B29B *1/06*; B01F *7/08*
U.S. Cl. 366—79 **9 Claims**



1. A machine for processing plastics materials having a screw mounted in a housing and made up of a plurality of screw members in the form of collars on a drive shaft, whereby screw members to suit a particular material treatment are secured against rotation on said drive shaft and can be exchanged when required for other screw members, the machine including a thrust arrangement to press the screw members axially into close engagement with one another, the thrust arrangement comprising a divided thrust ring axially supported on said drive shaft at one of the end zones thereof, thrust bolts which act on the adjacent end surface of the adjacent outermost one of said screw members and a sleeve closely surrounding the periphery of said divided thrust ring.

4,202,634

RACK FOR VESSELS AND MEANS FOR AGITATING THE VESSELS IN THE RACK

Jack A. Kraft, 119 Elm La., New Hyde Park, N.Y. 11040, and Harold D. Kraft, 147-14 70th Ave., Flushing, N.Y. 11367

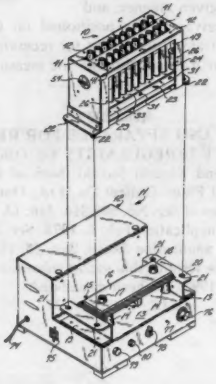
Continuation-in-part of Ser. No. 739,242, Nov. 5, 1976, Pat. No. 4,118,801. This application Sep. 22, 1978, Ser. No. 945,128
The portion of the term of this patent subsequent to Oct. 3, 1995, has been disclaimed.
Int. Cl.[2] B01F *11/00*
U.S. Cl. 366—111 **9 Claims**

1. A clamp for holding a vessel while the bottom of said vessel is subjected to an orbital movement, to spin liquid contained within said vessel, said apparatus comprising

a support member engaging the vessel at an upper portion thereof,

said support member comprising a resilient collar comprising a rubbery material to frictionally engage and hold said vessel in said collar while the bottom of said vessel receives said orbital movement,

said rubbery material of said resilient collar frictionally engaging said vessel and comprising yieldable characteristics permitting the bottom of the vessel to receive an orbital movement while said vessel is held within said resilient collar,



said liquid being spun under influence of said orbital movement,

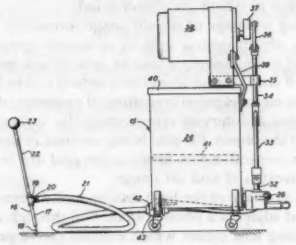
said support member and said vessel being arranged to define a null point of movement of said vessel to be centered within the region defined by said resilient collar to prevent spillage of the liquid contained in the vessel while being spun during said orbital movement.

4,202,635

PORTABLE DEVICE FOR MIXING TWO MATERIALS

Carl E. Hendrickson, P.O. Box 81, Sheridan, Wyo. 82801

Filed Dec. 2, 1977, Ser. No. 856,968
Int. Cl.[2] B01F *15/04*
U.S. Cl. 366—162 **10 Claims**



1. A portable device for mixing two materials in a desired proportion and dispensing the materials under pressure from a nozzle, said device comprising a separate container for each of said two materials; each of said containers having means for discharging the contents of the container under pressure from a discharge tube; a mixing tube of flexible material having a discharge end and an input end with a helical mixing element received in the mixing tube and extending between said ends,

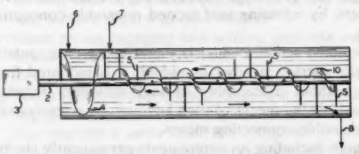
said element being a helically twisted strip member having projections extending from opposite edges thereof with the projections along one edge being offset from the projection along the other edge and with the twisting of said strip member causing the projections to extend outward from the axis of the member at different angles with two adjacent projections along one edge forming an angle of less than 180° and approximately 120°; a nozzle attached to the discharge end of the mixing tube; and coupling means attached to the input end for connecting the discharge tubes of the containers thereto so that a coaction of the mixing element and any bends of the flexible mixing tube provides a thorough mixing of the two materials as they pass along the tube prior to discharge from the nozzle.

4,202,636

MIXING DEVICE WITH INTERNAL RECYCLE

John W. Vanderveen, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 762,690, Jan. 26, 1977, Pat. No. 4,123,226.
This application Jun. 15, 1978, Ser. No. 915,860
Int. Cl.² B01F *7/04, 7/08*
U.S. Cl. 366—319 **6 Claims**



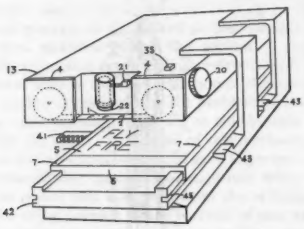
1. A mixing device comprising a vessel, a rotatable shaft therein, pins or tines mounted to depend from said shaft and adapted to be moved upon rotation of said shaft and means in combination with said shaft comprising an auger substantially of a size to force material in said vessel from an inlet end to an outlet end thereof, and a substantially smaller diameter flight blade having a reverse-pitch for impelling material in said mixture in a direction opposite to the normal flow from said inlet to said outlet end thereof.

4,202,637

METHOD AND MACHINE FOR DRY CHARACTER TRANSFER

Mauro Tummolo, 241 Suydam St., Brooklyn, N.Y. 11237, assignor to Mauro Tummolo, Brooklyn, N.Y.

Filed Nov. 14, 1977, Ser. No. 851,348
Int. Cl.² B41J *3/28*
U.S. Cl. 400—118 **17 Claims**



1. A machine for effecting the dry transfer of characters from a tape bearing on one side at least one character capable of being transferred to an object by rubbing the other side of said tape opposite the character to be transferred while said character is in contact with said object which comprises:

(a) Means adapted for holding a reel of such tape and for moving it back and forth over an object to receive the transfer of a character therefrom with said one side facing said object,

(b) Means for positioning an object to receive a character from said tape, and

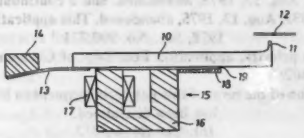
(c) Means for effecting the transfer of selected characters from the tape to the object comprising a rotary drive member, a plurality of rollers mounted in operative relation to said drive member for rotation in a plane parallel to the plane of said object and said tape.

4,202,638

DEVICE FOR POINTWISE ACTION ON AN INFORMATION CARRYING MEDIUM

Sven G. V. Stenudd, Lidingo, Sweden, assignor to Facit Aktiebolag, Atvidaberg, Sweden

Filed Oct. 11, 1977, Ser. No. 840,746
Claims priority, application Sweden, Oct. 11, 1976, 7112564
Int. Cl.² B41J *3/10*
U.S. Cl. 400—124 **11 Claims**



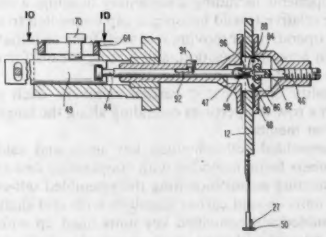
1. In a device for marking an information carrying medium in which a marking tip is provided on an arm means, first means are provided for moving the arm means in a first direction to urge the marking tip against a surface of the information carrying medium, and second means are provided for moving the arm means in a second direction to move the tip away from the information carrying medium, the arm means extending generally parallel to the surface of said information carrying medium and having a planar surface portion; the improvement comprising additionally a fixedly mounted land surface positioned to inhibit the displacement of said arm means in said second direction and being oriented precisely parallel to said planar surface portion when said arm means is at its extreme extent of motion in said second direction, said land surface and arm means comprising in combination an air pressure damping means for damping the movement of said arm means in said second direction by air pressure, said land surface being lateral of said second means along said arm.

4,202,639

DAISY LOADING APPARATUS

Michael J. Rello, Willow Grove, Pa., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Sep. 14, 1977, Ser. No. 833,276
Int. Cl.² B41J *1/30*
U.S. Cl. 400—171 **16 Claims**



1. In a printing apparatus of the type having a circular rotary character array having a hub portion, said character array

being driven by a rotary stepper motor of the type having an axis and a pair of stator elements spaced apart along said axis with an axial air gap therebetween, a rotor element integrally connected to said hub portion, and a support having two axially aligned portions at least one of which is retractable with respect to the other, said support carrying a clamping means for fixing the position of said array, the improvement comprising:

a movable guide means for mating with the outermost circumference of said array to align the center of the array with said axis.

4,202,640

KEYBOARD ASSEMBLY

Helmut Schmidt, Villingen-Schwenningen; Walter Strobel, Unterkirnach; Günter Treude, and Paul Blaser, both of Villingen-Schwenningen, all of Fed. Rep. of Germany, assignors to Kienzle Apparate GmbH, Villingen, Fed. Rep. of Germany

Continuation of Ser. No. 779,936, Mar. 21, 1977, Pat. No. 4,124,313, said Ser. No. 779,936, is a continuation of Ser. No. 604,332, Aug. 13, 1975, abandoned, and a continuation of Ser. No. 604,333, Aug. 13, 1975, abandoned. This application Apr. 27, 1978, Ser. No. 900,771

Claims priority, application Fed. Rep. of Germany, Aug. 22, 1974, 2440265

The portion of the term of this patent subsequent to Nov. 7, 1995, has been disclaimed.

Int. Cl.[2] **B41J** *5/12*

U.S. Cl. 400—491.2 **1 Claim**

1. A quick-assembly keyboard, for typewriters, calculators, data-processor input terminals, and the like, comprising, in combination,

a plurality of assembled self-contained key units, each assembled self-contained key unit comprising a plurality of components including a stationary housing, a shaft movable relative to said housing, a cap connected to said shaft and operative for moving said shaft from an initial position to an actuating position, and biasing means for restoring said shaft to said initial position;

a plurality of elongated carrier members, each provided with a row of apertures extending along the length of said carrier member,

said assembled self-contained key units and said carrier members being provided with cooperating first releasable connecting means mounting the assembled self-contained key units on said carrier members with said shafts of said assembled self-contained key units lined up with respective ones of said rows of apertures of said elongated carrier members, said first releasable connecting means mounting said assembled self-contained key units on said carrier members dismountably for dismounting of said key units from said carrier members from above said carrier members;

a circuit board provided with a plurality of electrical components,

said carrier members and circuit board being provided with cooperating second releasable connecting means dismountably mounting said carrier members upon said circuit board at a predetermined spacing from the latter independently of said first releasable connecting means and with said shafts of said key units lined up with predetermined ones of said electrical components,

each of said assembled self-contained key units including means holding said stationary housing, said shaft and said biasing means together in assembled condition independently of said first and second releasable connecting means, whereby dismounting of individual assembled self-contained key units from carrier members neither results in nor requires disassembly of the constituent components of the dismounted key units,

said carrier members being dismountable from said circuit board without dismounting of said assembled self-contained key units from said carrier members and without disassembly of the caps, stationary housings, shafts and biasing means of the key units of thusly dismounted carrier members, by releasing said second releasable connecting means,

each assembled self-contained key unit being dismountable from the carrier member on which it is mounted from above without disassembly of said stationary housing, shaft and biasing means of such key unit, by releasing said first releasable connecting means,

the key units including no components permanently electrically connected to any components on the circuit board, whereby to provide no hindrance to dismounting of carrier members from the circuit board nor to dismounting of individual assembled self-contained key units from carrier members,

the carrier members being mounted on the circuit board parallel to and adjoining each other so as to form a plurality of parallel and adjoining rows of key-unit caps.

4,202,641

MULTIPLE-POINT WRITING INSTRUMENT INCLUDING A MECHANICAL PENCIL UNIT

Yoshihiro Tomura, Omiya, Japan, assignor to Pilot Man-Nen-Hitsu Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 12, 1977, Ser. No. 841,434

Claims priority, application Japan, Oct. 16, 1976, 51-139243[U]

Int. Cl.[2] **B43K** *24/10, 24/18, 27/02*

U.S. Cl. 401—32 **4 Claims**

1. A multiple-point writing instrument, comprising in combination:

a cylindrical holder having top and bottom sections in axial alignment which are rotatable around the axis thereof relative to each other;

two writing units provided in side-by-side positions in said holder, one of said writing units being a mechanical pencil unit having an outer tube, a lead gripping jaw means in said outer tube, an inner tube fixed to said jaw means and extending rearwardly from said outer tube toward said top section, and a tightening ring fixed within said outer tube for normally tightening said jaw means to cause it to grip a lead and for releasing said jaw means to enable feeding out of the lead only when said inner tube and said jaw means are pushed relative to said tightening ring forward toward the writing end of said pencil unit;

a cradle mounted within said holder and connected to said bottom section, said cradle having means rotatably supporting said top section relative to said cradle and said bottom section for said relative rotation, said cradle supporting said mechanical pencil unit and the other writing unit in the side-by-side positions and constraining the units to independent longitudinal motions between retracted positions in which the writing ends of the units are within said holder and advanced writing positions in which the writing ends of the units project out of the lower end of said bottom section of said holder;

resilient means engaging said writing units and urging them toward the retracted positions;

a feed-out cam in the form of an overhanging ledge on the inside suface of said top section of said holder and slidably engaged with the two writing units for selectively moving the respective units from the retracted to an advanced position and then to an advanced writing position upon rotation of said top section in one or the other direction relative to said bottom section, said cam having a lower ledge portion with a notch therein for releasably locking a selected one of two writing units when it is in the advanced writing position, first and second sloping ledge portions on opposite sides of the lower ledge portion, and an upper ledge portion extending circumferentially around the inside of said holder in a plane at right angles to the axis of said holder for engagement by the two writing units when they are in the retracted position, said first and second sloping ledge portions being associated with the mechanical pencil unit and the other writing unit, respectively, said lower ledge portion extending circumferentially a relatively short distance substantially parallel with the upper ledge portion for engaging the writing units for placing them in the advanced position, said notch being disposed at a position circumferentially offset from the center of the lower ledge portion toward the second sloping ledge portion, whereby said top section must be rotated a greater angular distance to move the mechanical pencil unit from the advanced position to the locked writing position than to move the other writing unit from the advanced position to the locked writing position;

a pushbutton mounted in said top section of said holder normally projecting rearwardly therefrom and for relative movement only in the axial direction of the holder; and

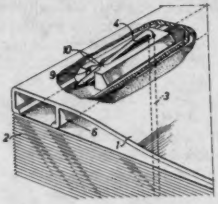
an offset pusher extending from the pushbutton toward said writing units normally disposed in side-by-side relationship with the upper end portion of said mechanical pencil unit and movable into substantial axial alignment with said inner tube of said mechanical pencil unit when said mechanical pencil unit is moved from the retracted to the locked writing position by the rotation of said top section of said holder relative to the bottom section, whereby said mechanical pencil unit is moved to said advance position by engagement of said first sloping ledge portion prior to the time said offset pusher comes into alignment with said mechanical pencil unit so said offset pusher does not collide with said mechanical pencil unit, and upon depression of said pushbutton following the movement of said mechanical pencil unit from the advanced position to the locked writing position, said inner tube of said mechanical pencil unit is pushed by said offset pusher and is thus made ready for writing or marking.

4,202,642

LOOSE-LEAF BINDER UTILIZING STIFF COVERS

Lars L. Sjöstedt, Ellågardsvägen 96, S-183 39 Täby, Sweden

Filed Jun. 28, 1978, Ser. No. 919,920
Int. Cl.[2] B42F *13/02*
U.S. Cl. 402—13 **7 Claims**



1. An apparatus for removably uniting a cover with a sheaf of pages having through holes at optional locations, said apparatus comprising:

at least one stem, each said stem passing through at least one said through hole thereby exposing one stem end for each said through hole passed through;

a separate first connecting means receiving each said stem end in a bent condition, each said first connecting means being positioned immediately adjacent said sheaf at its respective through hole whereby said stem passes only through said sheaf and said first connecting means;

a cover for said sheath;

a rail-like second connecting means positioned along the spline edge of said cover, said second connecting means being engagable with each of said first connecting means for connecting said cover to said sheaf at a position opposite said first connecting means; and

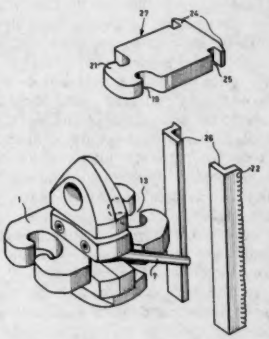
whereby said first connecting means may be positioned at optional hole spacings and said stems may be engaged without passing through said cover.

4,202,643

SOLID CONTAINER COUPLING DEVICE

Hans U. Backteman, Lusthusbacken 14, 161 39 Bromma, Sweden

Filed Sep. 18, 1978, Ser. No. 942,919
Claims priority, application Sweden, Sep. 27, 1977, 7710804
Int. Cl.[2] F16C *11/00*; F16D *1/12, 3/00*
U.S. Cl. 403—33 **6 Claims**



1. Container coupling having a central body including an operating aperture, a turnable shaft extending through said

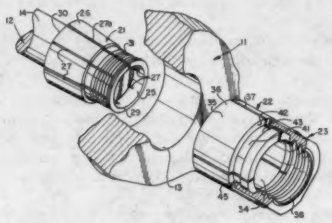
body and provided with a locking head at each end thereof, said heads facing in opposite directions and being sufficiently angularly displaced in relation to each other to enable said heads to selectively sequentially engage respective sockets of adjacent containers, filler pieces provided between said body and said locking heads, said body being provided with side locking means adapted lockingly to cooperate with complementary shaped side locking means in horizontal locking elements, and an operating handle extending into said operating aperture and being connected to said turnable shaft for turning said shaft and said locking heads through three distinct positions to thereby cause said sequential engagement of said head with said respective sockets of said adjacent containers.

4,202,644

MOUNTING DEVICE

Dimitri G. Soussloff, Wyomissing, Pa., assignor to Trantorque Corporation, Manheim, Pa.

Filed Jul. 10, 1978, Ser. No. 923,056
Int. Cl.[2] F16B *2/14*
U.S. Cl. 403—369 **9 Claims**



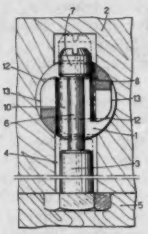
1. A mounting device for mounting a machine element having a cylindrical bore coaxially on a shaft having a cylindrical surface, said device comprising a segmented inner sleeve encircling the shaft, said inner sleeve comprising an integral member having a straight cylindrical interior bore corresponding in diameter to the external cylindrical surface of said shaft and having a tapered external surface, the segments of said inner sleeve providing a plurality of terminated axial slots extending longitudinally of said sleeve each extending from an end of the sleeve and terminating short of the other end, and a single axial through slot extending from end to end of the sleeve to permit contraction and expansion of said interior bore, said device also comprising a segmented outer sleeve encircling said inner sleeve, said outer sleeve having a tapered internal surface corresponding in angle of taper to the tapered external surface of said inner sleeve and having a straight cylindrical outer surface corresponding in diameter to the cylindrical bore of said machine element, said segmented outer sleeve comprising a plurality of separate separable segments, one end of said inner sleeve having external threads, the corresponding end of said outer sleeve having circumferential interlock means providing opposed forward and rearward radial surfaces substantially perpendicular to the central axis of said shaft, and a clamping nut threadedly engaged with the threaded end of said inner sleeve, said nut having cooperating circumferential interlock means defining opposed forward and rearward drive surfaces confronting the corresponding surfaces of the interlock means of said outer sleeve, whereby upon rotation of said nut in one direction, the forward surfaces of the respective interlock means engage and effect relative axial displacement of said sleeves in one direction, and upon rotation of said nut in the opposite direction, the rearward surfaces of the respective interlock means engage and effect relative axial displacement of said sleeves in the opposite direction, said displacements causing said tapered surfaces to expand and contract the interior bore and to contract and expand the exterior surface of said outer sleeve.

4,202,645

READILY RELEASABLE CLAMPING CONNECTOR

Fiorello Giovannetti, Via Marciano 4, Milano, Italy

Filed Nov. 7, 1978, Ser. No. 958,205
Claims priority, application Italy, Nov. 10, 1977, 22696/77[U]
Int. Cl.[2] B25G *3/00*; F16B *7/02*; F16D *1/00*; F16G *11/00*
U.S. Cl. 403—407 **7 Claims**



1. A device for releasably clamping a first part and a second part tightly together comprising:

a first member comprising a one-piece cylindrical body accommodated within a circular opening in one of the parts to be connected for rotation about an axis;

a second member comprising a protruding member secured to project from the other part;

said protruding member having a reduced diameter shank portion and an enlarged head end portion defining a shoulder facing the shank portion;

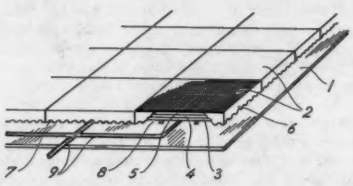
said one-piece cylindrical body having a through hole extending transverse to the rotation axis for receiving therethrough said shank and head end portions of said protruding member, said hole having a diameter at least equal to the diameter of said head end portion; a pair of opposing arcuate slits whose centerlines lie in a plane transverse to the rotation axis, said slits having a sufficient width to accommodate said shank portion and formed in opposite directions each from one end of said hole; at least one cam surface circumferentially extending from inside of the body towards a side surface of the body along an edge of at least one of said slits, said at least one cam surface cooperating with said shoulder to releasably clamp said protruding member.

4,202,646

HELICOPTER LANDING PLATFORM

Oystein Herstad, Vemorkveien, 4300 Sandnes, Norway

Filed Sep. 11, 1978, Ser. No. 941,132
Int. Cl.[2] E01C *9/10*
U.S. Cl. 404—36 **3 Claims**



1. A helicopter landing platform, comprising a grid structure disposed above a level surface and resting on said surface by means of a supporting framework, thereby to create a space between the grid structure and said surface, and means in said space for introducing a fire extinguishing substance into said

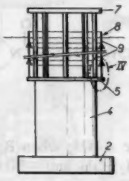
space, said grid structure comprising a fine mesh grid structure which rests on a coarse mesh grid structure.

4,202,647

BUOYANT BASE FOR MARINE PLATFORMS

Jacques E. Lamy, 6 rue d'Estienne d'Orves, Fontenay-Aux-Roses, France (92260)

Continuation of Ser. No. 771,342, Feb. 23, 1977, abandoned. This application May 25, 1978, Ser. No. 909,682
Claims priority, application France, Mar. 22, 1976, 76 08181
Int. Cl.[2] F02B *17/00*
U.S. Cl. 405—203 **19 Claims**



1. A method for transporting a marine platform structure from a land-like site to a deep water location, comprising the steps of:

a. initially constructing on said land-like site said marine platform structure comprising a base adapted to be secured to the underwater site, said base including a horizontal upper surface, a plurality of structural vertical columns forming an open structure which extends from said base upper surface for supporting said platform thereon;

b. temporarily rendering said base buoyant for towing by securing a plurality of removable elements about said structural members to form a continuous, watertight wall which cooperates with said base, said removable elements comprise panels which engage said base upper surface and extend upwardly to a distance above the water level;

c. towing the resulting buoyant structure over water to a preselected location where the platform structure is to be positioned;

d. immersing the support structure below the water level; and

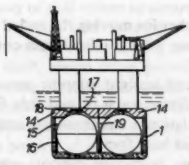
e. removing the panels from the support structure.

4,202,648

FLOATING PLANT FOR OFFSHORE LIQUEFACTION, TEMPORARY STORAGE AND LOADING OF LNG

Rolf Kvamsdal, Moss, Norway, assignor to Moss Rosenberg Verft A/S, Moss, Norway

Filed Aug. 28, 1978, Ser. No. 937,094
Claims priority, application Norway, Sep. 6, 1977, 773076
Int. Cl.[2] B63B *35/44*
U.S. Cl. 405—210 **6 Claims**



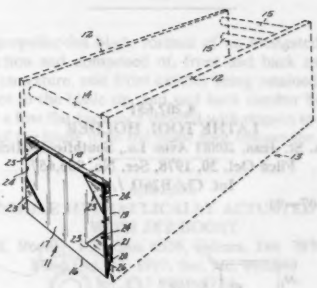
1. In a floating plant for off-shore storage and loading of LNG, the combination of, a submerged module positioned below the surface of the water, an exposed module positioned directly above said submerged module and above the surface of the water, rigid column means interconnecting said modules and supporting said exposed module upon said submerged module, LNG handling facilities mounted upon said exposed module, said submerged module having a plurality of compartments, a plurality of spherical storage tanks for LNG which correspond in number with the number of said compartments and are positioned respectively in said compartments, vertical skirt means comprising a cylindrical skirt substantially surrounding the lower hemisphere of each of said tanks with each of said tanks being supported thereby at substantially its horizontal equator, and means anchoring said submerged module to the sea floor whereby said submerged module is held in stable condition, and said submerged module has sufficient buoyancy to support the entire structure of said exposed module and said column means, with said exposed module being supported thereby above the zone of the surface of the water, and said column means extending throughout a predetermined zone above and below the surface of the water.

4,202,649

FRONT PLATE FOR TRENCH BOXES

John B. Cook, and Melvin Pike, both of East Lansing, Mich., assignors to Efficiency Production, Inc., Okemos, Mich.

Filed Dec. 4, 1978, Ser. No. 965,985
Int. Cl.[2] E21D *5/00*
U.S. Cl. 405—282 **4 Claims**



1. A front plate for trench boxes for location between a pair of elongate trench box panels at one end thereof and transverse between said panels, the combination including:

an upper horizontal structural shape member;

a lower horizontal structural shape member;

a plurality of vertical structural members between said horizontal structural members and against which said vertical structural members bear;

a plurality of triangularly shaped gusset members in spaced apart registry secured and depending from to the lower edge of said lower horizontal member;

an outer skin secured to said horizontal, said vertical and said gusset members in a plane relation and extending to the lowermost apex of said gusset member; and

a closure plate closing on said gusset members and connecting with said lower horizontal member and said outer skin at the bottom thereof.

4,202,650

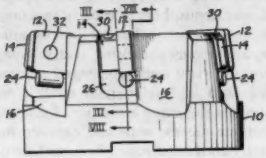
SHIM LOCK TOOLHOLDER

Robert A. Erickson, Ligonier, Pa., assignor to Kennametal Inc., Latrobe, Pa.

Filed Oct. 13, 1978, Ser. No. 951,022
Int. Cl.[2] B26D *1/12*
U.S. Cl. 407—46 **4 Claims**

1. In a cutter: a cutter body having at least one recess extending inwardly of the periphery thereof, said recess having an inwardly extending back wall and a front wall parallel thereto; said back and front walls defining a bottom to said recess

therebetween; a shim disposed in said recess and having a back side abutting said back wall thereof and being supported thereby, said shim having a front side substantially parallel to said back side; said shim having a protuberance extending from the front side thereof for engagement with a center hole on an



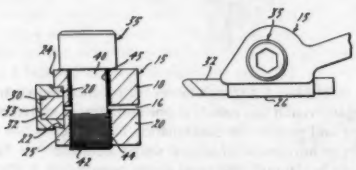
insert; an insert support pin extending transversely through said bottom wall and located adjacent said front wall so as to firmly abut a side of a cutting insert; and means for simultaneously moving said shim toward said bottom wall and toward said pin so that the cutting insert can be firmly clamped between the shim, the bottom wall and said pin.

4,202,651

LATHE TOOL HOLDER

William A. St. Jean, 20881 Avon La., Southfield, Mich. 48075

Filed Oct. 30, 1978, Ser. No. 955,657
Int. Cl.[2] B26D *1/00*
U.S. Cl. 407—91 4 Claims



1. A tool holder for lathes and the like comprising a body having a supporting arm adapted to be mounted in a tool post or the like and having an outer end bifurcated to define a pair of coacting resilient clamping arms movable toward each other by a compressive force exerted perpendicular to the plane of bifurcation, each of said clamping arms having an orifice extending entirely therethrough in a direction perpendicular to said plane, said orifices being coaxial, the clamping arms being of like thickness in a direction parallel to the axis of said orifices, characterized in that

A. both of said orifices have internal threads of like form and diameter

B. the threads in the two clamping arms lie on the same nominal helix

C. a clamping screw for said clamping arms is provided with a wrenchable head, a shank, and a screw portion at the end of the shank remote from the head and adapted to threadably engage the threads in said clamping arms

a. the shank joining the screw portion to the head and being of a diameter less than the minimum diameter of said internal threads in the clamping arms

b. the shank being of a length which slightly exceeds the thickness of one of said clamping arms.

4,202,652

CAPILLARY TYPE INK

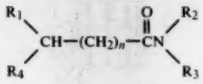
Phillip E. Sokol, Rockville, Md., assignor to The Gillette Company, Boston, Mass.

Filed Nov. 30, 1977, Ser. No. 855,946
Int. Cl.[2] B43K *8/02*
U.S. Cl. 401—196 9 Claims

1. A writing system comprising a capillary type writing instrument charged with an aqueous solution containing:

(a) from about 0.5% to about 15% by weight of a water soluble dye; and

(b) from about 1% to about 25% of an amide of the formula



wherein

R_1 is —H, —CH_3, or —NH_2 when R_2 is —$(CH_2)_2OH$ and R_3 is —H or —$(CH_2)_2OH$, and —NH_2 when R_2 and R_3 are —H,

R_4 is —H, —CH_3, or —NH_2, and

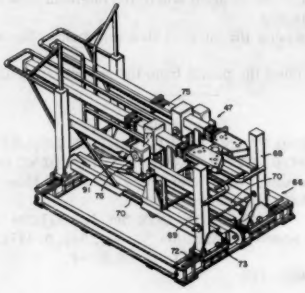
n is 0, 1, or 2.

4,202,653

PIPE HANDLING APPARATUS

Walter H. Moller, Bellevue, Wash., assignor to Western Gear Corporation, Everett, Wash.

Division of Ser. No. 682,052, Apr. 30, 1976, Pat. No. 4,129,221.
This application Jun. 27, 1978, Ser. No. 919,672
Int. Cl.[2] B65G *47/90*
U.S. Cl. 414—22 13 Claims



1. A modular stabber for moving the end of a pipe to or from a well hole axis along a longitudinal path comprising:

a base frame,

transversely spaced upright support means each forming part of a side frame, each of said side frames being in a side-by-side relation to each other and being movably mounted on said base frame,

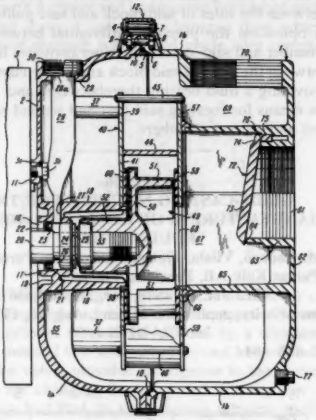
means for moving both said support means transversely equal amounts for adjusting the spacing between said side frames, longitudinally extendible pipe grabbing means on said side frames for positioning the pipe, and means for moving said longitudinally extending pipe grabbing means relative to said side frames to move the end of a pipe to and from the well hole axis.

4,202,654

WEAR RESISTANT SELF LUBRICATING CENTRIFUGAL PUMP

Alfred S. Marlow, 274 Robindale Dr., Leola, Pa. 17540

Filed Dec. 29, 1976, Ser. No. 755,253
Int. Cl.[2] F01D 11/00, 5/14
U.S. Cl. 415—113 18 Claims



1. A pump particularly advantageous for use in evacuating liquids and solids from a given location, comprising a housing having an inlet thereto and an outlet therefrom, an impeller within said housing, said housing having an opening accommodating the projection therein of a drive shaft arranged to mount said impeller interiorly of said housing, means defining a flow passage through said housing one end of which includes said inlet and the other said outlet, said impeller being positioned within and intermediately of the ends of said flow passage, a volute shaped structure contained between plate-like elements which form therewith a part of said flow passage, said volute shaped structure being positioned about and in encompassing relation to a peripheral portion of said impeller which is contained between said plate-like elements, said volute structure having a spiral configuration which opens to an exit chamber defined in said housing, a wall segment of which exit chamber includes said housing outlet, one of said plate-like elements having an opening therein which is in direct communication with said housing inlet, said impeller embodying vanes positioning peripherally about said plate opening whereby on drive of said impeller to induce an inflow of liquids and solids to said impeller by way of said housing inlet, the said vanes of said impeller being positioned to be operative to direct materials received thereby in a sense peripherally thereof, under pressure, to exit, by way of said volute structure, to said exit chamber, the means defining said opening accommodating said drive shaft also accommodating sealing means which position about said drive shaft, means being provided within said exit chamber to store a supply of lubricant and to place the same in open communication with said drive shaft and the sealing means thereabout, said lubricant storing means including a peripheral wall a portion of which is resilient and flexible and exposed to the flow of liquids and/or solids moved to and through said exit chamber and from said housing by way of said outlet, the pressure applied to move said liquids and/or solids being thereby applied directly to said resilient flexible portion of said lubricant storing means whereby to produce an automatic lubrication of said shaft and the sealing means embodied in association therewith.

4,202,655

PROPELLER FAN BLADING AND HUB THEREFOR

Ralph P. Maloof, 4527 Pk. Monaco, Calabasas, Calif. 91302

Filed Jun. 10, 1977, Ser. No. 805,283
Int. Cl.[2] B64C 11/18
U.S. Cl. 416—237 23 Claims

1. A propeller-fan blade formed of an elongated uniform cross section and comprised of, front and back cambers of uniform curvature, said front camber being retained from the blade root to the blade tip, and said back camber being truncated by a first flat back face tapered with respect to said front camber of the blade from the blade root toward the blade tip.

4,202,656

DOWNHOLE HYDRAULICALLY ACTUATED PUMP WITH JET BOOST

George K. Roeder, P.O. Box 4335, Odessa, Tex. 79760

Filed Oct. 17, 1977, Ser. No. 842,390
Int. Cl.[2] F04F 5/54
U.S. Cl. 417—88 2 Claims

1. A downhole hydraulically actuated pump assembly for lifting fluid from a borehole, a power tubing means connected to supply power fluid to the pump assembly, a formation fluid inlet means connected to supply formation fluid to the pump assembly, and a produced fluid flow path connected to the pump assembly through which produced and spent power fluid flows to the surface of the ground;

said pump assembly includes a jet pump having a high pres-

sure inlet, a lower pressure intake, and an exhaust, a double acting engine end, a control valve assembly, and a double acting production end;

said production end includes pistons reciprocatingly received in a cylinder thereof with production valve means connected to receive a flow of formation fluid thereinto and to force the produced fluid to substantially continuously flow towards said intake of said jet pump;

means connecting said engine end to actuate said pump end, said engine end having a power fluid inlet and a spent power fluid outlet, and a piston means reciprocatingly received within a working cylinder, means connecting said engine piston to actuate said pump piston;

means by which said control valve assembly conducts power fluid to and spent power fluid from said engine to cause the engine piston to reciprocate;

means connecting a source of high pressure fluid to said high pressure inlet of said jet pump, means connecting a source of produced fluid to said intake of said jet pump such that energy is extracted from the high pressure fluid in order to boost the flow of produced fluid up the produced fluid flow path;

said jet pump is mounted above said control valve means, while said engine end is interposed between said production end and said control valve means;

said jet pump has the high pressure inlet thereof connected to the spent power fluid flowing from said control valve assembly while the produced fluid from the production end is connected to the low pressure inlet of the jet pump;

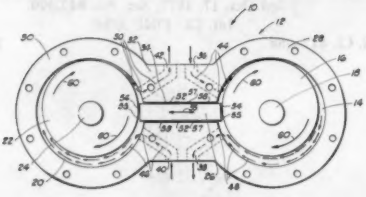
so that the produced fluid and the spent power fluid is admixed within the jet pump as the flow of the produced fluid is boosted.

4,202,657

FLUID PUMP

John E. Kice, Wichita, Kans., assignor to K-B Engineering Co., Wichita, Kans.

Filed Nov. 4, 1975, Ser. No. 628,740
Int. Cl.² F04C *17/00, 29/00*
U.S. Cl. 418—208 **5 Claims**



1. A fluid pump for compressing fluid therein, the pump comprising:

a pump housing having a first end portion, a second end portion and a center portion;

a first cylindrical chamber in the first end portion of said housing;

a first cylindrical eccentric rotor positioned in said first chamber and rotatably attached to said housing;

a first intake port in the center portion of said housing and connected to said first chamber;

a first discharge port on the center portion of said housing and connected to said first chamber;

a second cylindrical chamber in the second end portion of said housing and parallel to said first chamber;

a second cylindrical eccentric rotor positoned in said second chamber and rotatably attached to said housing;

a second intake port in the center portion of said housing and connected to said second chamber;

a second discharge port in the center portion of said housing and connected to said second chamber;

an angular shaped guideway in the center portion of said housing and therethrough, said guideway interconnecting said first chamber and said second chamber;

a rectangular shaped floating block slidably received in said guideway, the ends of said block disposed adjacent a portion of the cylindrical surface of said first and said second rotors as said rotors rotate in said chambers, the sides of said block disposed adjacent said guideway, the width of said guideway sufficient to provide clearance between the sides of said block and said guideway so that in operation the pressure differential between said first chamber and said second chamber provides fluid pressure between the sides of said block and said guideway thereby providing a fluid bearing therebetween; and

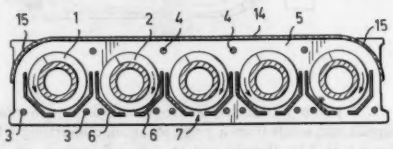
drive means for rotating said first and second rotors in said first and second chambers.

4,202,658

GLIDE-CASTING MACHINE FOR THE MANUFACTURING OF HOLLOW SLABS AND EQUIVALENT

Esko M. Ahonen, Viiala, Finland, assignor to Paraisten Kalkki Oy-Pargas Kalk AB, Parainen, Finland

Filed Jul. 13, 1978, Ser. No. 924,438
Claims priority, application Finland, Aug. 10, 1977, 772406
Int. Cl.² B29B *1/04*
U.S. Cl. 425—64 **14 Claims**



1. A glide-casting machine for the manufacturing of hollow slabs and equivalent, which machine is movable in relation to a casting base and which comprises:

means for feeding concrete mix;

at least two screw feeders;

vibrator sleeves constituting extension of each screw feeder;

external vibrating means;

two guide plates in connection with each screw feeder, arranged at least substantially parallel to the axis of the corresponding screw feeder, said guide plates at least partly following the shape of the corresponding screw feeder in the bottom portion thereof, said guide plates further defining between themselves an elongated space at least substantially parallel to the axis of the screw feeder so as to allow concrete mix to fall straight onto the base at least on a substantial portion of the length of the screw feeder; and

flow plates which follow at least the shape of the outermost screw feeders from above and from the sides.

4,202,659

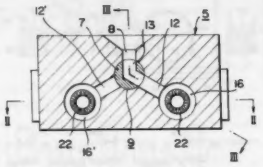
DEVICE FOR CHANGING A WIRE NETTING IN A FILTER DEVICE FOR SYNTHETIC RESINS

Tomoo Kinoshita, Tokyo, Japan, assignor to Nihon Repro Machine Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 8, 1978, Ser. No. 876,143
Claims priority, application Japan, Mar. 15, 1977, 52/27589
Int. Cl.² B29F *3/00*
U.S. Cl. 425—183 **2 Claims**

1. A device for changing a wire netting in a filter device for synthetic resins comprising a die body fixed in contact with an exhaust port of an extruding machine, said die body having a first hole for change drilled therein, a guide inlet communicating with said first hole for change and said exhaust port, a pair of second holes for screening drilled in said die body respec-

tively at both sides of said hole for change, a pair of guiding passages respectively communicating with said pair of second holes for screening, a pair of exhaust guide ways respectively communicating with said pair of second holes, a pair of valve sliding ways respectively having a larger diameter than those of said pair of exhaust guide ways and respectively communicating with said pair of exhaust guide ways and an exhaust port one end of which is opened and the other end of which communicates with a center and connecting portion of said pair of valve sliding ways, a valve for changing flow which has a guide opening through which said guide inlet communicates



with one of said pair of guide passages, said valve for changing flow being inserted into the hole for change and free to rotate therein, a cylinder strainer surrounded by a wire netting respectively inserted into said pair of second holes for screening, and a choke valve, movable in response to the movement of said valve for changing flow, inserted into the pair of valve sliding ways and free to slide therein wherein each of said valve sliding ways includes a longitudinal clearance seat for guiding resins from one of said valve sliding ways into said exhaust port when said choke valve enters said one of said valve sliding ways.

4,202,660

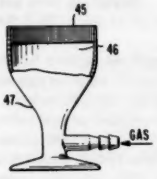
GLASS-CERAMIC ARTICLE AND METHOD OF MAKING SAME

Yu K. Pei, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 650,995, Jan. 21, 1976, which is a continuation of Ser. No. 146,665, May 25, 1971, abandoned, which is a continuation-in-part of Ser. No. 30,859, Apr. 22, 1970, abandoned. This application Mar. 29, 1977, Ser. No. 782,590

Int. Cl.[2] A21D *4/00*

U.S. Cl. 431—328 **3 Claims**



1. A burner for burning a gaseous fuel, said burner terminating in a burner grid comprising a matrix of integrally fused tubes forming a series of smooth, longitudinal, parallel passageways therethrough, wherein the walls defining said passageways

(1) have essentially zero porosity,

(2) consist essentially of an inorganic crystalline oxide glass-ceramic material,

(3) have an average coefficient of lineal thermal expansion of about -2 to $+12\times10^{-7}$/°C. (0°–300° C.),

(4) a thermal conductivity at 400° C. of less than 0.01 cal/cm/sec/cm^2/°C.,

wherein the inner diameter of said passageways is at least 3 times the wall thickness through portions of said walls common to adjacent fused tubes and wherein the matrix has an open frontal cross-sectional area of at least 60%.

4,202,661

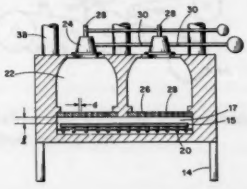
JET IMPLEMENT RADIATION FURNACE, METHOD AND APPARATUS

Lazaros J. Lazaridis, Lincoln; Gabor Miskolczy, Carlisle, both of Mass., and Paul K. Shefsiek, Farmington, Mich., assignors to Thermo Electron Corporation, Waltham, Mass.

Continuation of Ser. No. 882,166, Mar. 1, 1978, abandoned, which is a continuation of Ser. No. 751,410, Dec. 16, 1976, abandoned. This application Feb. 14, 1979, Ser. No. 11,981

Int. Cl.[2] F27B *9/02*

U.S. Cl. 432—8 **8 Claims**



1. The method of heating flat strip stock comprising the steps of:

supporting the stock in a furnace chamber below combustion chamber means and separated therefrom by an array of flat refractory plates lying in a common plane, said plates having a plurality of apertures therethrough of substantially equal size perpendicular to said common plane and distributed substantially evenly across said plates;

producing essentially complete combustion in the combustion chamber means for heating the array of plates to radiance at a temperature above approximately 1200° F.;

directing a flow of combustion products from said combustion chamber means through the apertures in the plates as uniform, discrete jets;

producing a pressure drop across said plates of sufficient magnitude that the jets are turbulent after emerging from the apertures in the plates;

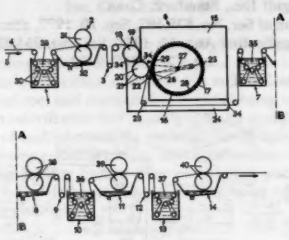
positioning the stock in the furnace chamber such that a horizontal surface thereof confronts the plates, said horizontal surface being positioned in the zone of maximum turbulence of said jets; and

continuously advancing the flat strip stock through the furnace chamber whereby said stock is heated simultaneously by convection from direct contact with said turbulent jets and by radiation from said plates, said convection and said radiation each contributing a substantial fraction of the total heat transferred to the stock.

4,202,662
PHOTOGRAPHIC PRINTING PROCESS, AND COMPOSITION AND DEVICE FOR USE THEREIN

Robert Boucher, Route du Bois de Nefles, Ile de la Reunion, 97490 Sainte-Clotilde, France, and André Foulquier-Gazagnes, Papeete, French Polynesia

Continuation of Ser. No. 562,976, Mar. 28, 1976, abandoned.
This application Jan. 26, 1978, Ser. No. 872,547
Claims priority, application France, Aug. 3, 1974, 74 11761
Int. Cl.[2] D06P *5/20*
U.S. Cl. 8—444 8 Claims



1. A method of photodyeing a natural or synthetic fiber which comprises:

(a) impregnating a dyeable support of said natural or synthetic fiber with an aqueous photosensitive composition comprising a leuco ester of a vat dyestuff, an acid-generating substance and a catalyst selected from the group consisting of ammonium vanadate or meta vanadate; and

(b) exposing to actinic light the moist inpregnated dyeable support.

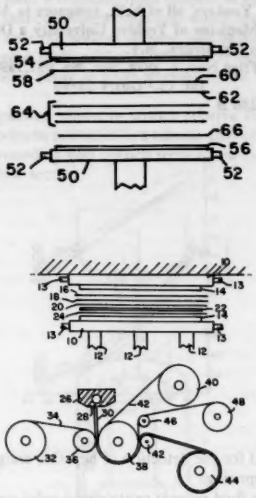
4,202,663
METHOD OF DYE ABSORPTION INTO THE SURFACE OF PLASTIC

John M. Haigh, deceased, late of Baton Rouge, La., and by Joyce E. Quinlan, administrator, 10421 Londonridge Ct., Cincinnati, Ohio 45252

Division of Ser. No. 540,383, Jan. 13, 1975, Pat. No. 4,059,471.
This application Sep. 6, 1977, Ser. No. 830,642
The portion of the term of this patent subsequent to Jan. 14, 1992, has been disclaimed.
Int. Cl.[2] D06P *5/00, 5/20, 1/16, 3/76*
U.S. Cl. 8—471 7 Claims

1. A method for rapid and continuous transfer of dye patterns to at least one plastic dye receptor comprising contacting a dye transfer web and a polyolefin dye carrier web in close contact; contacting the other side of said dye carrier web with said dye receptor and passing the same to a heat and pressure zone, applying heat and pressure thereto sufficient to releasably bond said dye receptor and said webs together in a tri-laminate; passing said tri-laminate from said pressure zone into a post-pressure heating zone which is heated to a temperature sufficient to sublime the dyes from said dye transfer web through said dye carrier web and into the surface of said dye receptor, cooling said tri-laminate below the softening temperatures of the components thereof and separating said webs from said decorated dye receptor.

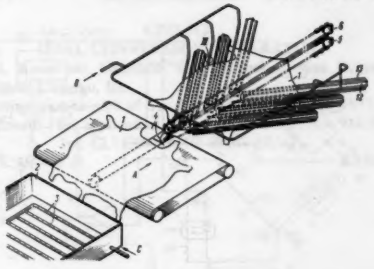
4. A method for rapid transfer of dye patterns to a plastic article comprising contacting a dye transfer web surmounted by a polyolefin carrier web with the surface of said plastic article, applying sufficient heat and pressure in a heat and pressure zone to releasably bond said webs to said article in a tri-laminate; releasing said pressure and applying heat to said tri-laminate while still in said zone sufficient to sublime the dyes from said dye transfer web through said dye carrier web and into the adjacent surface of said article to decorate and penetrate the same, cooling the tri-laminate to cool the components thereof below their softening temperatures and separating said webs from said article.



4,202,664
METHOD FOR CLEANSING CATTLE HIDES AND APPARATUS FOR REALIZING SAME

Natan M. Gimelfarb, ulitsa Pervomaiskaya, 67, kv. 67; Fedor T. Lugovnev, ulitsa Mayakovskogo, 40, kv. 18, and Nikolai E. Misjura, pereulok Treugolny, 13, all of Mogilev, U.S.S.R.

Filed Nov. 30, 1977, Ser. No. 855,981
Int. Cl.[2] C14C *1/00;* D01C *1/00*
U.S. Cl. 8—94.15 7 Claims



1. A method for cleansing hair covered hides comprising the steps of:

fixing a hide for movement and moving the hide substantially along its axis of symmetry;

simultaneously irrigating the hide and carding the hide's hair covering while the hide is moving along its axis of symmetry, thereby washing the hide and soaking while simultaneously removing foreign material adhering to the hair side of the hide; and

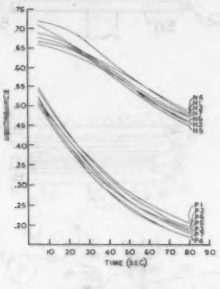
removing surface moisture from the hide.

4,202,665

DETECTION OF HEPATITIS B SURFACE ANTIGEN

Barry Wenz, White Plains; Arthur Karmen, Manhasset, and Chi Shun Feng, Yonkers, all of N.Y., assignors to Albert Einstein College of Medicine of Yeshiva University a Division of Yeshiva University, Bronx, N.Y.

Filed Nov. 6, 1978, Ser. No. 957,749
Int. Cl.[2] G01N *33/16*
U.S. Cl. 23—230 B 28 Claims



1. A method for the detection of hepatitis antigen in a fluid specimen comprising:

(a) feeding a fluid reagent containing a solid support having an antibody and a specimen containing an antigen specific to the antibody to a centrifuge

(b) accelerating the centrifuge to combine the specimen and the reagent; and

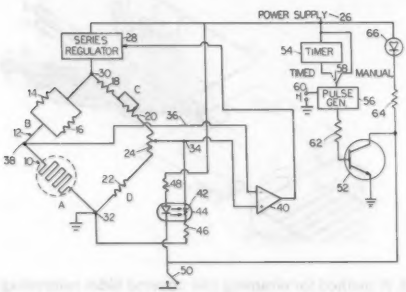
(c) measuring the rate of change in light absorbance caused by the motion of the solid phase support in a centrifugal field.

4,202,666

METHOD AND APPARATUS FOR PREVENTING THE DESTRUCTION OF AN ALKALI SOURCE OF A NITROGEN-PHOSPHOROUS DETECTOR

Randall C. Hall, Round Rock, and Burney J. Ehrlich, Austin, both of Tex., assignors to Tracor, Inc., Anstin, Tex.

Filed Feb. 24, 1978, Ser. No. 880,974
Int. Cl.[2] G01N *27/62, 31/08*
U.S. Cl. 23—232 E 9 Claims



1. In a method of chromatographic analysis utilizing an alkali sensitized ionization detector, the steps of:

reducing the temperature of the alkali source from a first, elevated temperature at which active analysis is performed to a second, lower temperature that is below the temperature at which reactive substances would react with the source, but is above the temperature at which condensation of non-volatile materials on the source occurs,

said reduction in temperature being made during the time that reactive substances are passing through the detector; and

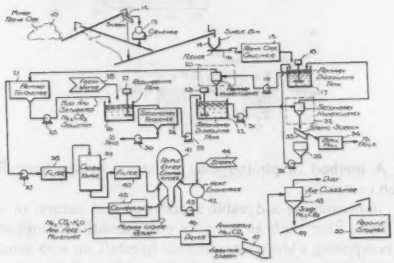
restoring the source temperature to the elevated temperature after the reactive substances have been eluted.

4,202,667

PROCESS FOR THE SEPARATION OF INSOLUBLE MATERIALS IN THE PRODUCTION OF SODA ASH

Edward H. Conroy, Green River, Wyo.; Arthur Gloster, New York, N.Y., and James A. King, Green River, Wyo., assignors to Texasgulf Inc., Stamford, Conn.

Continuation of Ser. No. 835,697, Sep. 20, 1977, abandoned. This application Aug. 16, 1978, Ser. No. 934,020
Int. Cl.[2] B01D *9/02*
U.S. Cl. 23—302 T 4 Claims



1. In a process for the production of soda ash from trona by the normal monohydrate process including the steps of calcining said trona to form a mixture of sodium carbonate and insoluble impurities, forming an initial aqueous solution of said carbonate containing a slurry of said impurities, separating said impurities from said sodium carbonate solution to form a purified solution, crystallizing sodium carbonate monohydrate from said purified solution and drying such crystals to form soda ash, the improvement comprising subjecting said initial solution to a first hydrocyclone separation step to provide a first overflow containing dissolved sodium carbonate and relatively fine insoluble impurities and a first underflow containing dissolved sodium carbonate and relatively coarse insoluble impurities, subjecting said first overflow successively to thickening, filtration, color removal, filtration, crystallization and drying steps to provide a soda ash product, and adding said first underflow to an aqueous medium to form a second slurry and then subjecting said second slurry to a second hydrocyclone separation step to provide a second overflow and a second underflow, recycling said second overflow to said initial aqueous solution, and subjecting said second underflow to a screening step to provide a screen oversize fraction which is discarded and a screen undersize which is recycled to said initial aqueous solution.

4,202,668

GELLED FUEL SIMULANT

Nathan J. Sippel, Ridgecrest; Earl J. Hiser, China Lake, and John Christy, Ridgecrest, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 15, 1970, Ser. No. 64,153
Int. Cl.[2] C10L *7/00*
U.S. Cl. 44—7 A 2 Claims

1. An inert simulant formulation for metallized gelled fuel composition comprising an admixture of about 30 to 40 percent by weight hydrocarbon fuel selected from the group consisting of kerosene, aviation gasoline, white gasoline, toluene, and benzene, about 60% by weight aluminum powder, about 1–2% by weight silicon dioxide, and from 0.4 to 5% by weight napalm powder to simulate a density of from about 1.4 to 1.5

grams/cc, a viscosity of about 150 centipoises at shear rate of 10^4 sec^{-1} at 77° F. and ability to flow at −65° F.

4,202,669

FIRE-LIGHTERS

Andrew C. Ball, Tunstead Farm, Tunstead La., Greenfield, Saddleworth, Near Oldham, Lancashire, England

Filed Apr. 28, 1976, Ser. No. 680,999

Claims priority, application United Kingdom, Apr. 30, 1975, 18095/75; Jul. 11, 9175, 29313/75; Jan. 8, 1976, 596/76

Int. Cl.² C10L *11/00*

U.S. Cl. 44—40 **5 Claims**

1. A method of manufacturing a fire-lighter, comprising the steps of forming a combustible envelope of an air-impervious, flexible material, inserting a combustible material in fluid form into said envelope, said combustible material being settable and including an odoriferous fuel capable of being transferred from the surface of said combustible material during handling, sealing said envelope, and allowing said combustible material to set, whereby the fire-lighter may be handled and placed in position in a fire without dirtying the hands or releasing the odour of the fire-lighter.

4,202,670

METHOD FOR PREVENTING SEDIMENTATION OF FINELY POWDERED COAL IN COLLOIDAL FUEL

Tetsuya Tateishi, Higashi-Murayama, Japan, assignor to Agency of Industrial Science & Technology, Ministry of International Trade & Industry, Tokyo, Japan

Filed Sep. 25, 1978, Ser. No. 945,102

Claims priority, application Japan, Sep. 29, 1977, 52-117009

Int. Cl.² C10L *1/32*

U.S. Cl. 44—51 **2 Claims**

1. A method for preventing sedimentation of finely powdered coal in a colloidal fuel comprised of the finely powdered coal dispersed in heavy oil and containing a minor amount of water, comprising the steps of immersing insulated electrodes in the colloidal fuel and applying an electric potential of 500 V to 1000 V thereto to create an electric field substantially free of sparks in the colloidal fuel and thereby increasing the viscosity of the colloidal fuel owing to the electroviscous effect brought about by the electric field.

4,202,671

FUEL CONDITIONER

Richard C. Diehl, Shingle Springs, Calif., and Jerry L. Walker, Coraopolis, Pa., assignors to Calgon Corporation, Pittsburgh, Pa.

Filed Jul. 21, 1978, Ser. No. 926,692

Int. Cl.² C10L *1/30*

U.S. Cl. 44—68 **3 Claims**

1. A fuel oil conditioning composition consisting essentially of from 0.1 to 10 parts by weight of at least one organic magnesium compound selected from the group consiting of magnesium sulfonates and magnesium carbonates per part by weight of at least one organic manganese salt of mixed aliphatic acids.

4,202,672

APPARATUS FOR GASIFICATION OF FINELY DIVIDED FUEL

Pieter J. Schuurman, The Hague, Netherlands, assignor to Shell Internationale Research Maatschappij B.V., Netherlands

Filed Nov. 25, 1977, Ser. No. 854,650

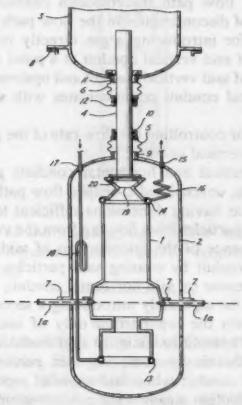
Claims priority, application United Kingdom, Dec. 24, 1976, 54037/76

Int. Cl.² C10J *3/86*

U.S. Cl. 48—77 **2 Claims**

1. In an apparatus for gasification of finely divided fuels in suspension by reaction with oxygen-containing gases at elevated pressure comprising a gasification chamber having combustors therein on a common center line and being contained in an outer pressure shell and a tubular quench section on top of said gasification chamber and penetrating into a superposed waste heat boiler, wherein said gasification chamber and said pressure shell have a common fixed support at the level of the center line of said combustors and said waste heat boiler has a fixed support near the bottom thereof, said gasification chamber, said pressure shell, said tubular quench section and said waste heat boiler being in axial alignment, the improvement comprising:

(a) heat expansion means to absorb relative thermal expansion differences provided in a tubular part of said pressure shell surrounding said quench section and connected with said quench section;



(b) further heat expansion means to absorb thermal expansion differences between said waste heat boiler and common thermal expansion of said gasification chamber and said intermediate quench section provided in a tubular part at the bottom of said waste heat boiler surrounding said quench section and connected with said quench section;

(c) each of said heat expansion means comprising longitudinally elastic elements of tubular parts of said pressure shell and said waste heat boiler, respectively, formed by corrugated bellow type sections of said tubular parts.

4,202,673

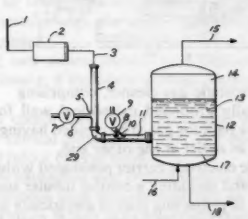
COAL CONVERSION APPARATUS

Ted M. Knowlton, Hinsdale, Ill., assignor to Gas Research Institute, Chicago, Ill.

Continuation-in-part of Ser. No. 799,196, May 23, 1977, abandoned. This application Aug. 17, 1978, Ser. No. 934,515

Int. Cl.² C10J *3/50*; B65G *53/42*

U.S. Cl. 48—86 R **4 Claims**



1. An apparatus for the conversion of finely divided solid coal particles into gaseous products which comprise, in combination:

(i) a fluidized bed coal gasification reactor adapted to maintain a fluidized bed of coal particles in the bottom portion thereof;

(ii) a substantially vertical conduit having an upper end and a bottom end, said conduit adapted to receive said finely divided solid coal particles in the upper end thereof;

(iii) a substantially horizontal conduit, one end thereof communicating with the bottom end of said vertical conduit and the other end thereof adapted to discharge said coal particles from the horizontal conduit into the bottom fluidized bed portion of the reactor;

(iv) said communicating vertical and horizontal conduits positioned to provide a generally continuous, unrestricted L-shaped flow path therethrough characterized by the absence of discontinuities in the flow path;

(v) means for introducing a gas directly into the bottom portion of said vertical conduit at a point above the bottom end of said vertical conduit and upstream from where the vertical conduit communicates with said horizontal conduit;

(vi) means for controlling the flow rate of the gas introduced into said vertical conduit;

(vii) said vertical and horizontal conduits providing said continuous, unrestricted L-shaped flow path further characterized as having dimensions sufficient to prevent said solid coal particles from flowing from the vertical conduit in the absence of the introduction of said gas into said vertical conduit by causing said particles to assume an angle of repose on said horizontal conduit; and

(viii) means for separately introducing a second gas stream directly into the top portion only of said unrestricted horizontal conduit to minimize agglomeration of said coal particles therein by removing said particles from said horizontal conduit when said angle of repose is formed, said introduction means being positioned upstream of the discharge end of the horizontal conduit.

4,202,674

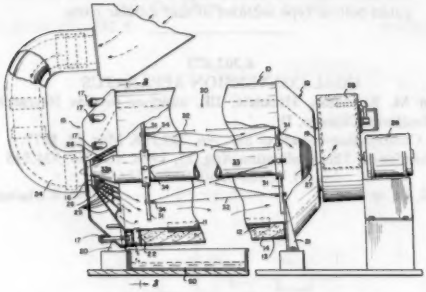
ELECTROSTATIC GAS CLEANER

Phillip R. Rodenberger, and William A. Smith, both of Muncie, Ind., assignors to Ball Corporation, Muncie, Ind.

Filed Sep. 15, 1978, Ser. No. 942,763

Int. Cl.[2] B03C *3/14, 3/41, 3/74*

U.S. Cl. 55—108 **11 Claims**



1. An electrostatic gas cleaner, comprising

an electrically grounded cylindrical wall forming a large open flow path for gas to be cleaned having an inlet at one end and an outlet at the other end,

a removable electrode carrier positioned within the cylindrical wall and including a central tubular support having a plurality of projecting rods of electrically non-conductive material at each end of the central tubular support to engage the cylindrical wall and support the electrode carrier coaxially within the cylindrical wall,

a wire electrode connected to the plurality of projecting rods, said wire electrode being fastened adjacent the center of each of the projecting rods and strung between the rods at each end of the central tubular support in a cylindrical array,

an inlet closure having an inlet opening and including a plurality of gas distributing vanes positioned at the inlet end of the large open flow path,

an exhaust closure having an exhaust opening at the outlet end of the large open flow path means connected to the exhaust closure for urging gas through said cleaner, and

means to charge the wire electrode to remove particulate matter carried by said gas and deposit said particulate matter on the walls of said gas cleaner.

4,202,675

COLLECTOR ELECTRODES FOR ELECTROSTATIC PRECIPITATORS

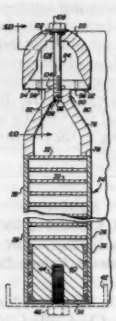
Horst Honacker, Paradise Valley, Ariz., assignor to Envirotech Corporation, Menlo Park, Calif.

Division of Ser. No. 705,096, Jul. 14, 1976, which is a division of Ser. No. 579,960, May 22, 1975, Pat. No. 3,998,611. This application May 1, 1978, Ser. No. 901,435

The portion of the term of this patent subsequent to Oct. 26, 1993, has been disclaimed.

Int. Cl.[2] B03C *3/78*

U.S. Cl. 55—118 **3 Claims**



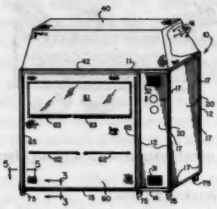
1. A collector electrode for electrostatic precipitators comprising: a hollow cylindrical body having upper and lower open ends; said body having substantially annular upper and lower edge portions; said collector electrode having a substantially vertical axis concentric with said annular edge portions; said body having an inner concave annular wall and an outer convex annular wall; said inner and outer walls being spaced apart; lightweight filler means between said walls; said filler means connecting said walls together; said inner and outer walls and said upper and lower edge portions bonded together and encapsulating said lightweight filler means; a water distributor fixed to said annular upper edge portion of said body member; said water distributor being generally annular and having a pair of upwardly converging shoulder structures which extend in continuity upward from said inner and outer walls; a generally tubular water conduit means supported on said pair of shoulder structures and said conduit means having a series of downwardly directed water outlet openings; each of said series of said water outlet openings disposed to deliver water downwardly onto one of said shoulders of said pair of shoulder structures.

4,202,676

SAFETY ENCLOSURE

Michael H. Pelosi, Jr., and Raymond Fink, both c/o Airo Clean Engineering, Inc., 520 Abbott Dr., Broomall, Pa. 19008

Filed Jul. 31, 1978, Ser. No. 929,834
Int. Cl.[2] B01D *51/10;* A61L *9/00;* A61B *19/02*
U.S. Cl. 55—269 12 Claims



1. A portable self contained enclosure to provide a clean room environment which comprises

a portable housing having

a frame with rigid side and rear panels,

members for detachably securing one of said side panels to one end of said frame for interior access,

said housing having an open bottom,

an air blower,

a dividing panel positioned inside said housing separating the interior of said housing into a chamber for said air blower accessible at said one of said side panels and an operational chamber,

a front wall closing said air blower chamber,

a plenum chamber attached to and closing off the top of said housing and being in communication with said air blower chamber for delivery of air thereto from said air blower chamber,

said air blower chamber being in communication with said operational chamber for receiving air therefrom,

a perforated ceiling panel member between said operational chamber and said plenum chamber,

filter means in said air blower chamber for receiving air from said air blower,

an impervious access curtain providing a front wall closing the front of said operational chamber and having members detachably securing said curtain to said frame, and

said frame having around the lower margin thereof a sealing gasket for engagement with the floor.

4,202,677

FILTER BAG WITH REMOVABLE SHAPING MEMBERS

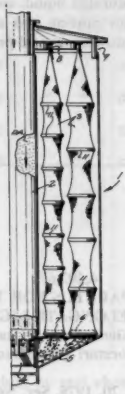
Ralph H. Clarke; W. James Clarke, and Steven L. Mays, all of Eugene, Oreg., assignors to Clarke's Sheet Metal, Inc., Eugene, Oreg.

Continuation-in-part of Ser. No. 809,113, Jun. 22, 1977, abandoned. This application Aug. 7, 1978, Ser. No. 931,465
Int. Cl.[2] B01D *46/02*
U.S. Cl. 55—378 8 Claims

1. In a tubular shaped filter bag having an air pervious main body of cylindrical configuration and supported at its ends within an air sructure, the improvement comprising,

bag shaping members located in a spaced apart manner along the bag, and

retainer means associated with each of said members and normally confining one of said bag shaping members in place about the bag body, each of said retainer means including a fabric cuff secured to the bag body and permitting temporary removal of a bag shaping member prior to removal of the filter bag for laundering purposes, said cuff being stitched adjacent one edge thereof to the bag body with a remaining adjustable cuff portion adapted to support a bag shaping member in a removable manner, cuff sizing means carried by and acting on said remaining cuff portion to enable contractive adjustment of same for



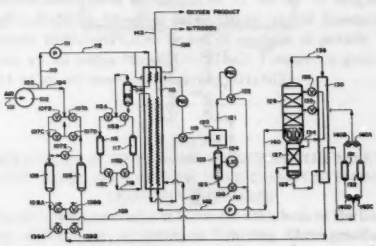
retention of the bag shaping member and alternatively expansive adjustment of the cuff for removal of said shaping member.

4,202,678

AIR SEPARATION LIQUEFACTION PROCESS

Leonard J. Hvizdos, Emmaus, Pa., assignor to Air Products & Chemicals, Inc., Allentown, Pa.

Filed Oct. 9, 1975, Ser. No. 620,963
Int. Cl.[2] F25T *3/00*
U.S. Cl. 62—38 13 Claims



1. A process for at least partially liquefying an air feed stream for delivery to a distillation column at a preselected temperature and pressure for separation into its components which comprises:

compressing an air feedstream,

splitting the air feedstream into at least a major portion and a minor portion with the major portion being at least partially cooled,

compressing said minor portion to a pressure above the critical pressure, if the minor portion is below the critical pressure,

cooling said compressed minor portion to a temperature below the critical temperature until said minor portion is converted into a critical fluid,

isentropically expanding said critical fluid in a Pelton Wheel under conditions such that the liquefied air is withdrawn from the Pelton Wheel at its saturation temperature or at a temperature below its saturation temperature, said Pelton Wheel being operated in a vapor environment established and maintained by the method selected from the group consisting of injecting a second gas into the Pelton

Wheel at the saturation temperature, or at a temperature slightly above the saturation temperature, raising the enthalpy of the liquefied air to an enthalpy above the enthalpy of the saturated liquid, and

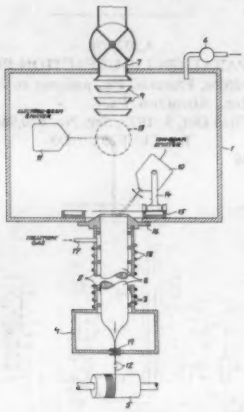
combining said major portion and said minor portion for forming an air feedstream at said preselected pressure and temperature.

4,202,679

PROCESS AND APPARATUS FOR THE CONTINUOUS PRODUCTION OF ELONGATE LIGHT CONDUCTORS

Giuseppe Cocito, San Giusto Cans-se, Italy, assignor to CSELT - Centro Studi e Laboratori Telecomunicazioni S.p.A., Turin, Italy

Filed Nov. 20, 1978, Ser. No. 962,186
Claims priority, application Italy, Nov. 25, 1977, 69655 A/77
Int. Cl.[2] C03B *37/02*
U.S. Cl. 65—2 12 Claims



1. A process for producing an elongate light conductor of indefinite length, comprising the steps of:

(a) placing a vitreous seed rod in a vertical position with an exposed upper end extending into a vaccum chamber;

(b) depositing successive amounts of a powdered glassy material in said vacuum chamber on the upper end of said rod while training a beam of ions of a refractivity-controlling doping substance, to be implanted in said glassy material, upon a limited area of said upper end;

(c) fusing the deposited material with said doping substance onto said rod, thereby progressively extending same upwardly;

(d) progressively lowering the upwardly growing rod at an average speed corresponding to its growth rate;

(e) thermally softening the lower end of the descending rod sufficiently to enable its mechanical deformation;

(f) drawing the softened lower end of said rod into a vitreous strand of reduced cross-section; and

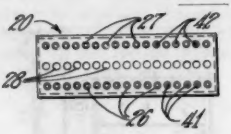
(g) continuously varying the relative position of said beam of ions and said upper end to distribute said substance in a predetermined pattern over the cross-section of said strand.

4,202,680

FLUID FLOW APPARATUS IN COMBINATION WITH GLASS FIBER FORMING APPARATUS

Thomas K. Thompson, Granville, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Oct. 16, 1978, Ser. No. 951,542
Int. Cl.[2] C03B *37/02*
U.S. Cl. 65—12 19 Claims



1. A nozzle in combination with a glass fiber forming bushing comprising:

(a) a chamber having an inlet;

(b) a first outlet means opening from said chamber for discharging fluid from said chamber;

(c) a first duct means abutting said chamber in open communication with said chamber and surrounding said first outlet means;

(d) a second outlet means opening from said chamber for discharging fluid from said chamber;

(e) a second duct means abutting said chamber in open communication with said chamber and surrounding said second outlet means; and

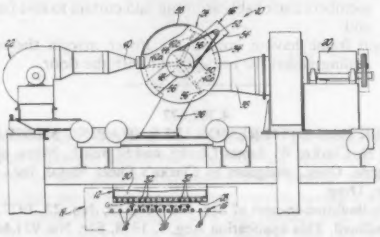
(f) a third outlet means opening from said chamber and adapted for discharging fluid from said chamber between said first duct means and said second duct means.

4,202,681

VACUUM HOLDER SYSTEM AND METHOD FOR USE IN BENDING GLASS

Harold A. McMaster, 420 Water St., Woodville, Ohio 43469, and John S. Nitschke, 324 E. Second St., Perrysburg, Ohio 43551

Continuation-in-part of Ser. No. 872,202, Jan. 25, 1978, abandoned. This application Dec. 11, 1978, Ser. No. 968,231
Int. Cl.[2] C03B *23/02*
U.S. Cl. 65—104 15 Claims



1. A system for use in bending glass comprising: a vacuum holder having a downwardly facing surface including spaced openings therein; a roller conveyor for conveying a heated sheet of glass below the vacuum holder in a vertically spaced relationship thereto; first means for providing relative vertical movement between the holder surface and a heated sheet of glass below the holder surface on the conveyor so as to position the holder surface in proximity with the heated sheet of glass; and second means for initially drawing a vacuum within the holder surface openings to support a heated glass sheet against the holder surface and for subsequently reducing the extent of vacuum drawn to prevent deformation of the heated sheet of glass at the openings in the holder surface, the first means being operable to position the holder surface with the

heated sheet of glass thereon above the roller conveyor in a spaced relationship such that a mold can be moved under the holder above the conveyor, and the second means subsequently supplying positive gage pressure air to the holder surface openings to force the heated glass sheet downwardly away from the holder surface so that bending can take place on the mold.

8. A method for supporting and quick releasing heated sheets of glass being conveyed for processing, the method comprising: conveying a heated sheet of glass on a roller conveyor to below a downwardly facing surface of a vacuum holder; providing relative vertical movement between the heated sheet of glass and the holder to position the sheet of glass in proximity to the holder surface; initially drawing a sufficient vacuum within spaced openings in the downwardly facing surface of the vacuum holder so as to support the heated sheet of glass in engagement therewith; then reducing the degree of vacuum drawn within the holder surface openings to prevent deformation of the heated glass sheet at the openings; positioning the holder surface with the heated sheet of glass thereon in a spaced relationship above the roller conveyor so a bending mold can move between the conveyor and the holder surface; and subsequently supplying positive gage pressure air to the holder surface openings to force the sheet of glass downwardly away from the holder surface.

10. A system for use in bending glass comprising: a heating chamber; a conveyor for conveying glass to be heated through the heating chamber; a holder located above the conveyor within the heating chamber; the holder including a plenum and a downwardly facing surface having restricted openings communicating the plenum and the heating chamber; a gas jet pump located within the heating chamber and having a passage that communicates the holder plenum and the heating chamber; and a pressurized gas source located externally of the heating chamber and communicated with the passage of the jet pump so as to produce a primary gas flow therethrough away from the holder plenum toward the heating chamber in order to thereby induce a secondary gas flow from the plenum to the heating chamber such that a vacuum is drawn at the holder surface openings to receive a heated sheet of glass from the conveyor and support the glass sheet against the holder surface.

4,202,682

GLASS MANUFACTURE

Philip W. Black, Bishops Stortford, England, assignor to International Standard Electric Corporation, New York, N.Y.

Continuation of Ser. No. 684,431, May 7, 1976, abandoned. This application Nov. 10, 1977, Ser. No. 850,116

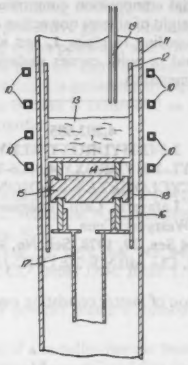
Int. Cl.[2] C03B 5/16

U.S. Cl. 65—136 **14 Claims**

1. A method of making high purity glass comprising a plurality of glass forming constituents, comprising the steps of:

heating a portion of said constituents in a powdered form to form a melt therefrom; and

adding the remainder of each of said constituents to said melt as a product of a chemical vapor deposition reaction, by



forming said product by said chemical vapor deposition reaction at or near the surface of said melt.

4,202,683

FERTILIZER

Edwin K. Schuman, 100 W. 14th St., Rolla, Mo. 65401

Filed Apr. 14, 1977, Ser. No. 787,626

The portion of the term of this patent subsequent to Mar. 22, 1994, has been disclaimed.

Int. Cl.[2] C05B 7/00, 13/00, 11/06, 17/00

U.S. Cl. 71—35 **10 Claims**

1. A farm field granular, soluble fertilizer of grade 21-12-7 + 1.2 Mg comprising the reaction products obtained by admixing approximate parts by weight of 12. oz. av. of langbeinite ($2MgSO_4,K_2SO_4$), 16 oz. of water, 16 oz. av. of diammonium phosphate $(NH_4)_2HPO_4$, 6 oz.av. of muriate of potash, KCl, 0.24 oz. av. of borax $Na_2B_4O_7{:}10H_2O$, 1 oz.av. of guar gum and 34 oz.av. of ammonium nitrate NH_4NO_3.

4,202,684

CARBANILIC ACID ESTERS, PROCESS FOR MAKING THE SAME AND HERBICIDAL COMPOSITIONS CONTAINING SAME

Friedrich Arndt, and Gerhard Boroschewski, both of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin & Bergkamen, Fed. Rep. of Germany

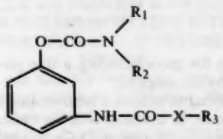
Continuation-in-part of Ser. No. 730,716, Oct. 8, 1976, abandoned. This application Aug. 24, 1978, Ser. No. 936,477

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1975, 2557552

Int. Cl.[2] A01N 9/12; C01C 125/06

U.S. Cl. 71—100 **26 Claims**

1. A carbanilic acid ester of the formula



in which

R_1 is chloro- or bromoalkyl,

R_2 is phenyl, methylphenyl, halogenophenyl, trifluoromethylphenyl or methoxyphenyl,

R_3 is straight chain or branched alkyl, alkenyl, or alkinyl, the

number of carbon atoms in all these groups being 1 to 4, and in which

X is oxygen or sulfur.

24. A herbicidal composition comprising from about 10 to about 80% by weight of at least one active agent constituted by a compound according to claim **1**, and about 90 to 20% by weight of a liquid or solid carrier material or both of these types of carrier materials.

4,202,685

2-1-(2-HYDROXY ALKYL IMINO)-ETHYL-1-HYDROXY-4,4,6,6-TETRAMETHYL CYCLOHEXEN-3,5-DIONES

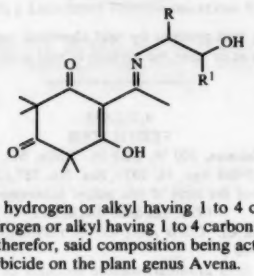
Ronald J. Rusay, Lafayette, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Sep. 29, 1978, Ser. No. 947,218

Int. Cl.[2] **A01N** *9/20*; **C07C** *119/00*

U.S. Cl. 71—121 **8 Claims**

7. A composition of matter consisting essentially of an effective amount of



wherein R is hydrogen or alkyl having 1 to 4 carbon atoms, and R^1 is hydrogen or alkyl having 1 to 4 carbon atoms and an inert carrier therefor, said composition being active as a post-emergent herbicide on the plant genus Avena.

4,202,686

PROCESS FOR MANUFACTURING FINE POWDER OF METAL

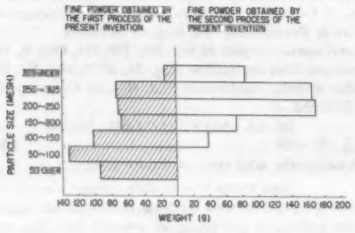
Taizo Ohmura, Ohmiya; Noboru Yonezawa, Urawa, and Kazuo Ikuta, Kawagoe, all of Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 6, 1977, Ser. No. 857,886

Claims priority, application Japan, Dec. 27, 1976, 51-156469; Apr. 23, 1977, 52-46350

Int. Cl.[2] **B22F** *1/02*

U.S. Cl. 75—0.5 B **28 Claims**


FINE POWDER OBTAINED BY THE FIRST PROCESS OF THE PRESENT INVENTION
FINE POWDER OBTAINED BY THE SECOND PROCESS OF THE PRESENT INVENTION
PARTICLE SIZE (MESH)
+150
150~325
200~250
150~200
100~150
50~100
-50
140 120 100 80 60 40 20 0 20 40 60 80 100 120 140 160 180 200
WEIGHT (9)

1. A process for manufacturing a fine powder of a metal, characterized by the steps of:

admixing a metal in at least a semi-molten state, which is to be pulverized, in a vessel with an assistant-powder, said assistant-powder consisting of a material which has a higher melting point than said metal and is difficult to chemically react with said metal and/or difficult to form a solid solution with said metal, and the temperature of said at least semi-molten metal being lower than the melting point of said assistant-powder;

mixing said at least semi-molten metal and said assistant-powder by stirring so as to ensure uniform dispersion of said assistant-powder in said at least semi-molten metal;

slowly cooling said at least semi-molten metal and said assistant-powder, while continuing said stirring, until the temperature of said at least semi-molten metal reaches at least its solidus point, to pulverize said metal into a fine powder and to form a composite powder having a structure in which said assistant-powder adheres to said fine powder to cover the entire surface of each particle of said fine powder; and then,

separating and removing said assistant-powder from said composite powder, thereby obtaining a fine powder of said metal.

4,202,687

LOW MELTING POINT NI-CR ALLOY FOR CAST DENTAL PRODUCTS

Kentaro Murayama, Osaka, and Kazuyuki Nakano, Toyonaka, both of Japan, assignors to Sankin Industry Co., Ltd., Osaka, Japan

Filed Mar. 28, 1979, Ser. No. 24,864

Claims priority, application Japan, Apr. 5, 1978, 53-40698

Int. Cl.[2] **C22C** *19/05*

U.S. Cl. 75—134 C **2 Claims**

1. A low melting point Ni-Cr alloy for dental casting comprising at least the following components:

Cr	7–20%
Cu	15–35%
Mn	15–35%
Ge	0.5–15%
Al	0.1–3%
Deoxidizer	0.1–3%
	ni balance (by weight)

4,202,688

HIGH CONDUCTIVITY HIGH TEMPERATURE COPPER ALLOY

Jacob Crane, Woodbridge; Eugene Shapiro, Hamden, both of Conn.; Stanley Shapiro, DeWitt, N.Y., and Brian Mravic, North Haven, Conn., assignors to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 947,963, Oct. 2, 1978, abandoned, which is a continuation of Ser. No. 547,367, Feb. 5, 1975, abandoned. This application Apr. 30, 1979, Ser. No. 34,403

Int. Cl.[2] **C22C** *9/00*; **C22F** *1/08*

U.S. Cl. 75—153 **11 Claims**

1. A silver free copper base alloy possessing high strength and high conductivity consisting essentially of from about 0.012 to about 0.5% of an element selected from the group consisting of the lanthanide series of the Periodic Table and mixtures thereof, from about 0.011 to about 0.5% of phosphorus, from about 0.007 to about 0.4% magnesium, balance essentially copper, wherein said alloy contains precipitate particles of the lanthanide and phosphorus, Mg_3P_2, and a precipitate consisting essentially of the lanthanide, magnesium and phosphorus wherein said quantities of said lanthanide, said magnesium and said phosphorus may be other than the stoichiometric ratios thereof defined by an equation wherein phosphorus content equals the content of said lanthanide divided by 4.52 plus the content of said magnesium divided by 1.17 while maintaining high strength and high conductivity.

5. The alloy of claim **1** wherein said precipitate consisting essentially of the lanthanide, magnesium and phosphorus possesses a coarse string-like structure.

4,202,689

METHOD FOR THE PRODUCTION OF SINTERED POWDER FERROUS METAL PREFORM

Eiji Ohno, Tokyo, and Kazuo Chikugo, Hiratsuka, both of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Aug. 7, 1978, Ser. No. 931,320
Claims priority, application Japan, Aug. 5, 1977, 52-93375
Int. Cl.[2] B22F *1/00*
U.S. Cl. 75—211 3 Claims

1. A method for reducing surface oxides of finely divided ferrous metal particles comprising the steps of; heating said ferrous metal particles to a temperature of about 130° C. to 150° C.;

coating said ferrous metal particles with thermoplastic phenol resins having an effective carbon content of 10 to 40 percent by adding said phenol resins to said ferrous metal particles, wherein said phenol resins are present from about 1.0 to 7.0 percent of the total mixture;

cooling said resin coated ferrous metal particles by blowing cooling air thereto; and

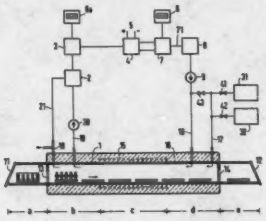
heating said resin coated ferrous metal particles to a temperature within the range of about 1100° C. to 1250° C. for a time sufficient to achieve reduction of said resin coated ferrous metal particles.

4,202,690

SETTING AND CONTROLLING DESIRED REDOX POTENTIALS IN GASES

Peter Funke, Rodenbach, Fed. Rep. of Germany, assignor to Alkem GmbH, Hanau, Fed. Rep. of Germany

Filed Oct. 3, 1977, Ser. No. 839,016
Claims priority, application Fed. Rep. of Germany, Dec. 6, 1976, 2655206
Int. Cl.[2] B22F *3/12*
U.S. Cl. 75—224 6 Claims



1. In a method of treating solid bodies containing oxygen by passing the bodies through a furnace wherein the bodies are subjected to a high temperature in an atmosphere of protective gases containing hydrogen having a predetermined redox potential to produce heated bodies of good quality, flowing countercurrent to the bodies in the furnace, the improvement comprising, continuously withdrawing a sample of the protective gas surrounding the bodies undergoing treatment at high temperature in the furnace, continuously measuring the redox potential of the sample of protective gas at the high temperature, and correcting a deviation of the redox potential of the sample from the predetermined redox potential by humidifying the protective gases flowing through the furnace to maintain said atmosphere of protective gases containing hydrogen having a predetermined redox potential.

4. In a method of treating solid bodies containing oxygen by passing the bodies through a furnace wherein the bodies are subjected to a high temperature in an atmosphere of protective gases containing hydrogen having a predetermined redox potential to produce heated bodies of good quality, flowing countercurrent to the bodies in the furnace, the improvement comprising, continuously withdrawing a sample of the protective gas surrounding the bodies undergoing treatment at high temperature in the furnace, continuously measuring the redox potential of the sample of protective gas at the high temperature, and correcting a deviation of the redox potential of the sample from the predetermined redox potential by humidifying the protective gases flowing through the furnace to maintain said atmosphere of protective gases containing hydrogen having a predetermined redox potential, and wherein an oxygen/-hydrogen mixture is used for humidification, and wherein the oxygen/hydrogen mixture is generated by electrolysis of water and the electrolysis current is controlled as a function of the measured redox potential.

4,202,691

METALLO-THERMIC POWDER

George Yurasko, Jr., Glencove, N.Y., assignor to Eutectic Corporation, Flushing, N.Y.

Filed Nov. 21, 1978, Ser. No. 962,673
Int. Cl.[2] B05D *1/08*; B22F *1/00*
U.S. Cl. 75—252 26 Claims

1. A flame spray powder mixture formed of the following constituents:

(a) agglomerates of a metallo-thermic heat-generating composition comprised essentially of fine particles of a reducible metal oxide formed from a metal characterized by a negative free energy of oxidation ranging up to about 60,000 calories per gram atom of oxidation referred to 25° C. intimately combined together by means of a thermally fugitive binder with fine particles of a strong reducing agent consisting essentially of a metal characterized by a negative free energy of oxidation referred to 25° C. of at least about 90,000 calories per gram atom of oxygen

(b) said agglomerates being uniformly mixed in an amount ranging from about 10% to 80% by weight with about 90% to 20% by weight of at least one coating material selected from the group consisting of metals, alloys, refractory oxides, and carbides, silicides, nitrides, and borides of the refractory metals of the 4th, 5th, and 6th Groups of the Periodic Table.

4,202,692

TUNDISH FLUX POWDER

George F. Carini, Penn Hills, Pa., assignor to The Clay Harden Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 874,025, Feb. 1, 1978, abandoned. This application Apr. 18, 1979, Ser. No. 31,068
Int. Cl.[2] C22B *9/10*
U.S. Cl. 75—257 4 Claims

1. In the process of continuous casting of steel wherein the steel is teemed into a tundish from which it is poured into a continuous casting mold, the improvement comprising the step of during the teeming operation providing a tundish flux powder on the surface of the molten metal in the tundish consisting essentially of, in weight percent,

Calcium Carbonate: 31 to 75
Alkali Metal Carbonate: 4 to 14
Fluorspar: up to 18
Sodium Fluoride: 14 to 38.

4,202,693

RECORDING MATERIAL HAVING INTERSECTING CONDUCTIVE STRIPS AND APERTURED SPACING MEANS

Roland Moraw, and Gunther Schadlich, both of Naurod, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 2, 1976, Ser. No. 719,713
Claims priority, application Fed. Rep. of Germany, Sep. 5, 1975, 2539524
Int. Cl.[2] G03G *16/00*
U.S. Cl. 430—50 13 Claims

1. A recording material comprising:

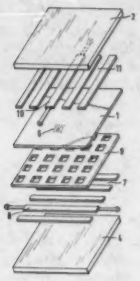
(a) a first transparent, dielectric support member having on

one surface thereof a plurality of first elongated, electrically conductive strips extending adjacent one another in spaced relationship,

(b) a layer comprising a photo-conductive thermoplastic material adjacent to, but spaced from, said surface of said first support member,

(c) spacing means interposed between said photo-conductive layer and said first support member for spacing them apart,

(d) a second transparent dielectric support member positioned contiguous to said photo-conductive layer on the side opposite said first support member, said second support member having on the surface thereof adjacent said photo-conductive layer a plurality of second elongated, electrically conductive strips extending adjacent one another in spaced relationship, the longitudinal axis of each of said second elongated, electrically conductive strips extending generally transversely to the longitudinal axis of each of said first elongated, electrically conductive strips to form cross-over regions, and



(e) said spacing means comprises a layer of an electrically insulative material having a plurality of apertures therein, said apertures coinciding with the cross-over regions between the first elongated conductive strips and the second elongated conductive strips.

4,202,694

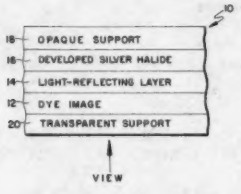
PENDANT OXIME POLYMERS AND PHOTOGRAPHIC USE THEREOF

Lloyd D. Taylor, Lexington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 789,422, Apr. 21, 1977, abandoned. This application Apr. 7, 1978, Ser. No. 894,545

Int. Cl.[2] **G03C** *1/40, 5/54, 7/00, 5/30*

U.S. Cl. 430—215 **44 Claims**



17. In a photographic process wherein a photosensitive element having a negative component comprising a blue-sensitive, a green-sensitive and a red-sensitive silver halide layer, said layers having associated therewith, respectively, a yellow, a magenta and a cyan dye image-providing material; and a positive component comprising a dyeable stratum is photoexposed to form a developable image, an aqueous alkaline processing composition including a viscosity-increasing reagent, titanium dioxide and at least one pH-sensitive optical filter agent which is colored at the pH of said composition and substantially colorless at a lower pH, is applied as a layer between the positive and negative components to develop said negative component, as a function of said development an imagewise distribution of soluble and diffusible dye is formed, and said imagewise distribution is transferred, at least in part, by diffusion to said dyeable stratum to impart thereto a dye transfer image, said image being viewable against the background of said applied layer including titanium dioxide as a dye transfer image, without separation of said components;

the improvement wherein said viscosity-increasing reagent comprises a polymeric oxime containing repeating pendant oxime groups and having a pKa of at least 12.

4,202,695

PHOTOGRAPHIC LIPPMANN EMULSIONS

Herman A. Philippaerts, Edegem; Robert J. Pollet, Vremde, both of Belgium; Wolfgang Müller-Bardorff, Cologne, Fed. Rep. of Germany; Wilhelm Saleck, Schildgen, Fed. Rep. of Germany; Anita von König, Leverkusen, Fed. Rep. of Germany; Walter Gauss, Cologne, Fed. Rep. of Germany; Franz Moll, Leverkusen-Stinbuchel, Fed. Rep. of Germany, and Theofiel H. Ghys, Kontich, Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

Continuation of Ser. No. 311,160, Dec. 1, 1972, abandoned. This application Jan. 30, 1975, Ser. No. 545,742

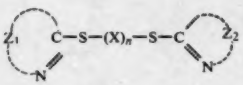
Claims priority, application Fed. Rep. of Germany, Dec. 9, 1971, 2161045

Int. Cl.[2] **G03C** *5/04, 5/00, 1/28*

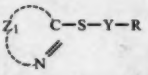
U.S. Cl. 430—8 **6 Claims**

1. A method of microphotography including the steps of negative or reversal development of an exposed Lippmann emulsion to create an image, said emulsion at the time of development comprising a derivative of a heterocyclic mercaptan corresponding to one of the following formulae I and II:

I.



II.



wherein:

each of Z_1 and Z_2 represents the atoms necessary to complete a 5- or 6-membered heterocyclic ring system,

n—is 0 or 1,

X—is —CO— or —CS—,

R—represents an alkyl group or an aryl group, and

Y—is —CO—, —COO—, —CS—, —SO_2—, —CON(R_1)— or —CSN(R_1)— wherein R_1 is hydrogen, an alkyl group or an aryl group in an amount sufficient to enhance image sharpness and reduce distortion of the image.

4,202,696

METHOD OF REMOVING SURFACE TACK OF CURED FREE RADICAL POLYMERIZED RESIN COMPOSITION USING ORGANIC CARBONYL COMPOUND

Gensho Takahashi; Kazuhito Miyoshi, and Yoneharu Tanaka, all of Fuji, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed May 16, 1978, Ser. No. 906,890

Claims priority, application Japan, May 23, 1977, 52-58799

Int. Cl.[2] **G03C** *1/68*

U.S. Cl. 430—306 **8 Claims**

1. A method of removing surface tack of a cured free radical polymerized resin composition which comprises impregnating the surface layer of the cured free radical polymerized resin

composition with at least one organic carbonyl compound capable of abstracting a hydrogen atom out of other compounds under irradiation with actinic rays, and irradiating the impregnated layer of the cured resin composition with actinic rays having wavelengths of from 200 to 300 nm.

4,202,697

PRODUCTION OF ETCH-RESIST COLLOID AND MATERIAL SUITABLE THEREFOR

Hugo V. Van Goethem, Edegem; Marcel Stroobants, Muizen, and Walter F. De Winter, S-Gravenwezel, all of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

Filed May 30, 1978, Ser. No. 910,333

Claims priority, application United Kingdom, Jun. 1, 1977, 23203/77

Int. Cl.[2] **G03C** *5/00, 1/68*

U.S. Cl. 430—306 **13 Claims**

1. Process for image-wise modifying the surface of an element e.g. to produce a printing form by making an etchant diffuse through a layer applied to said surface, the said layer forming an etch resist with image-wise differentations in permeability for etchants characterized in that said etch resist is formed by the steps of image-wise exposing to actinic radiation a layer of a hydrophilic colloid binder containing in the absence of any ethylenically unsaturated photopolymerisable monomeric material, a dispersed phase of at least one radiation sensitive polymer the polymer chain of which comprises units with side substituents containing oxime ester groups, whereby the permeability of the hydrophilic colloid layer for an etchant is reduced in conformity with the image-wise exposure.

4,202,698

QUINOXALINES AND THEIR USE IN PHOTOGRAPHIC PROCESSES

Gerald Jan; Remon Hagen, and John Lenoir, all of Marly, Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

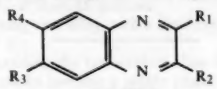
Continuation-in-part of Ser. No. 799,020, May 20, 1977, abandoned. This application Feb. 26, 1979, Ser. No. 15,384

Claims priority, application Switzerland, May 24, 1976, 6521/76

Int. Cl.[2] **G03C** *7/00, 1/76*

U.S. Cl. 430—418 **12 Claims**

1. Process for the production of colored photographic images by the silver dye bleach process which comprises the steps of imagewise exposing a photographic material containing on a substrate, at least one silver halide emulsion layer with a bleachable dyestuff, then (1) developing the silver image obtained, (2) dye bleaching and silver bleaching said silver image, (3) silver fixing and (4) washing, said dye and/or silver bleaching step being carried out in a bath containing at least one bleach catalyst of the formula



(1)

in which R_1 and R_2 independently are alkyl with 1 to 5 carbon atoms, R_3 is alkyl with 1 to 5 carbon atoms, $—CH_2OR_5$, CH_2NRR', $—CH_2OCOR$, $—CH_2Cl$, $—CH_2Br$, CH_2SR, $—CH_2O(CH_2)_pOR$, $—CH_2PO(OR_5)_2$, $—CH_2PO(OR_6)_2$, $CH_2SO_3R_6$, $—O(CH_2)_mOR$, $—O(CH_2)_pSO_3R_6$ or $—(OCH_2CH_2)_nOAr$, R_4 is hydrogen or alkyl with 1 to 5 carbon atoms or alkoxy of 1 to 4 carbon atoms, when R_3 is other than an alkyl radical with 1 to 5 carbon atoms, or R_4 is —OH, —NRR', —NHCOR, —NHCOAr', —NHCOAr', —NHSO_2R_5 or —NHSO_2Ar', R and R' independently are hydrogen or alkyl with 1 to 4 carbon atoms, R_5 is alkyl with 1 to 4 carbon atoms, R_6 is hydrogen, an alkali metal cation or $—N^{\oplus}(R)_4$, Ar is aryl or sulphonated aryl, Ar' is aryl or substituted aryl, m is 3 or 4, n is 1 to 3 and p is 2 to 4.

4,202,699

LITHOPLATES OF QUATERNARY AMMONIUM SALT COMPOSITIONS

John M. Kitteridge, and Robert J. Armstrong, both of Leeds, England, assignors to Vickers Limited, London, England

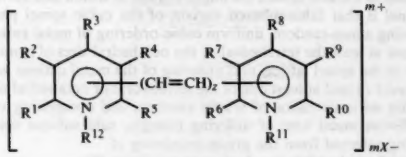
Division of Ser. No. 788,299, Apr. 18, 1977, Pat. No. 4,126,468, which is a continuation-in-part of Ser. No. 700,506, Jun. 28, 1976, abandoned. This application Aug. 7, 1978, Ser. No. 931,642

Claims priority, application United Kingdom, Jun. 28, 1975, 27435/75

Int. Cl.[2] **G03F** *7/02;* **G03C** *1/94*

U.S. Cl. 430—302 **8 Claims**

1. A radiation sensitive plate comprising a substrate formed of grained and anodised aluminium and having a surface coated with a radiation sensitive layer based on a radiation sensitive composition comprising a quaternary ammonium salt of the type which accepts at least one electron on exposure to radiation to form a substance capable of causing metal to be deposited onto said substance from an electroless plating solution in contact with said substance and comprising a salt of said metal and a reducing agent, said quaternary ammonium salt having the general formula



wherein R^1 to R^{10} are hydrogen or halogen atoms or organic substituents; R^{11} and R^{12}, if present, are each halogen atoms or organic substituents or together represent a divalent organic substituent; Z is zero or an integer; X^- is an anion; m = 1 or 2; and at least one of the nitrogen atoms is quaternary.

4,202,700

GLASSY COMPOSITION FOR HERMETIC SEALS

James A. Wilder, Jr., Albuquerque, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 2, 1979, Ser. No. 35,157

Int. Cl.[2] **C03C** *3/22, 3/16, 3/04*

U.S. Cl. 106—39.6 **3 Claims**

1. A glassy composition having high chemical durability and low gas permeability for hermetically sealing to aluminum and its alloys comprising: about 40 mole percent Na_2O, 10 mole percent BaO, 1 mole percent Al_2O_3, and 49 mole percent P_2O_5, and wherein said glassy composition has a thermal coefficient of expansion of about $235 \times 10^{-7°}$ C.$^{-1}$.

4,202,701

ASPHALT-ALUMINUM COATING COMPOSITION

Bruce A. Radebaugh, Bradley; Paul J. O'Connor, and Howard J. Fischer, both of Kankakee, all of Ill., assignors to Mortell Company, Kankakee, Ill.

Filed Aug. 29, 1977, Ser. No. 828,673

Int. Cl.[2] **C08L** *95/00*

U.S. Cl. 106—278 **1 Claim**

1. An asphalt-aluminum coating material comprised of:

about 57 percent by weight of an asphaltic base selected from the group consisting of parrafinic, naphthenic, or aromatic asphalts, said base being reduced to about 65 percent solids in aliphatic solvent,

about 10.5 percent by weight of an aluminum paste containing about 65 percent metal solids, which is added to said coating composition to provide reflectance,

about 20 percent by weight of solid filler particles added to said coating composition to provide body, wherein said

solid filler particles comprise about 8 percent by weight perlite and about 12 percent limestone,
about 4 percent by weight of a gelling agent comprising attapulgite or sepiolite clay,
about 0.1 percent by weight of a dehydrating agent comprising silica which functions to absorb residual water,
about 7.7 percent by weight of a petroleum-base solvent comprising mineral spirits which is added to adjust viscosity of said coating composition, and
about 0.7 percent by weight of a surfactant comprising nonylphenoxypoly(ethyleneoxy)ethanol.

4,202,702

INORGANIC PIGMENT COMPRISING A SOLID SOLUTION OF DIFFERING SPINELS

James W. Nuss, Rocky River, Ohio, assignor to Ferro Corporation, Cleveland, Ohio

Filed Dec. 26, 1978, Ser. No. 972,707
Int. Cl.[2] C09C *1/00, 1/22, 1/36, 1/40*
U.S. Cl. 106—288 B **16 Claims**

1. In a multiple spinel inorganic pigment comprising a solid solution of a solvent spinel containing within its crystal structure the spinel-forming oxides of at least a second, differing spinel as a solute spinel, the improvement in which said solvent spinel is that lithium-based variant of the cubic spinel phase having a non-random, uniform cubic ordering of metal cations about at least the tetrahedral or the octahedral sites of symmetry in the spinel lattice, said ordering of the metal cations with respect to said at least one of the tetrahedral or octahedral sites being an ionic ratios of whole numbers and comprising two different metal ions of differing charges, said solvent spinel being selected from the group consisting of:

(a) $Li^{+1}A_5^{+3}O_8$ in which A is Al, Fe or Ga,

(b) $Li_2^{+1}B^{+2}C_3^{+4}O_8$ in which B is Co, Zn, Mn, Cd, or Mg, and C is Ti or Ge, and

(c) $Li^{+1}D^{+3}Cr_4^{+3}O_8$ in which D is Al or Fe,

said non-random, uniform cubic ordering of said metal cations forming an ordered system of oriented metal cations about said sites to form a substantially identical substructure around those ions of the spinel lattice which generate color and thereby impart a pure color to said pigment.

4,202,703

METHOD OF STRIPPING PHOTORESIST

John R. Zuber, Piscataway, and Herbert Foxman, Raritan, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Nov. 7, 1977, Ser. No. 849,471
Int. Cl.[2] C03C *23/00;* **B08B** *7/00, 30/00*
U.S. Cl. 134—2 **5 Claims**

1. A method of stripping from a substrate a film of photoresist selected from the group consisting of diazide naphthalene sulfonic acid resists and resists derived from acrylic or methacrylic acids comprises

immersing the substrate in a solution consisting essentially of tetramethyl ammonium hydroxide in a lower alcohol at a temperature from about 70°–78° C., and

immersing the substrate in 1,1,1-trichloroethane.

4,202,704

OPTICAL ENERGY CONVERSION

Rodney T. Hodgson, Ossining; Harold J. Hovel, Katonah, and Jerry M. Woodall, Bedford Hills, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

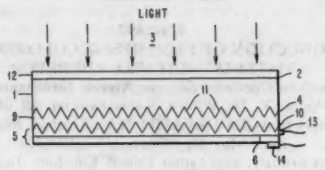
Filed Dec. 13, 1978, Ser. No. 968,887
Int. Cl.[2] H01L *31/04*
U.S. Cl. 136—89 CL **10 Claims**

1. An optical conversion device comprising in combination:

a translucent frequency shifting support member having an essentially crystalline structure with a first interatomic spacing and further having first and second essentially parallel major surfaces, said first major surface adapted to receive incident radiation;

a semiconductor photoresponsive active region facing said second major surface of said support member and having a second interatomic spacing; and

a crystal perfection accommodation region epitaxial with both said second major surface of said support member



and said photoresponsive region and having a third interatomic spacing of a size between said first and said second interatomic spacings and being interposed between said support member and said photoresponsive region.

4,202,705

TREATING BATH, FORMING A MIXED CARBIDE LAYER OF VA-GROUP ELEMENTS ON A FERROUS ALLOY SURFACE AND RESULTING PRODUCT

Noboru Komatsu; Tohru Arai, both of Toyoake, and Hinonori Fujita, Aichi, all of Japan, assignors to Kabushiki Kaisha Toyoto Chuo Kenkyusho, Japan

Filed Jul. 3, 1978, Ser. No. 921,794
Claims priority, application Japan, Jun. 30, 1977, 52-80411
Int. Cl.[2] C23C *9/10*
U.S. Cl. 148—6.11 **14 Claims**

1. A method for forming a mixed-carbide layer of Va-Group elements of the Periodic Table on an article of ferrous alloy, containing at least 0.10 percent by weight of carbon in its composition, which comprises:

immersing the article in a molten treating bath having from 1 to 40 weight percent of at least one oxide of at least one Va-Group element, from 1 to 40 weight percent of at least one metal or alloy of at least one Va-Group element other than any Va-Group element in oxide form and at least one member selected from the group consisting of boric acid and a borate; the percentages being based on the total weight of the molten treating bath; and the weight of Va-Group elements in the metal or alloy being at least 10 percent of the weight of the oxide;

maintaining said article in said molten treating bath to form a mixed-carbide surface layer of Va-Group elements on the article; and

removing said article from the molten treating bath.

4,202,706

CORROSION RESISTANCE TREATMENT OF ALUMINUM WITH N-ALKYL-FLUOROALIPHATICSULFONAMIDOPHOSPHONIC ACIDS AND SALTS THEREOF

Richard G. Newell, Woodbury, and Dale C. Perry, Welch, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

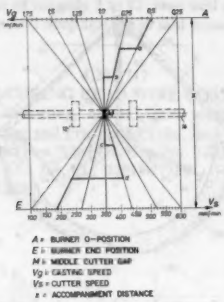
Filed Mar. 12, 1979, Ser. No. 19,732
Int. Cl.[2] C25D *11/24;* **C23F** *7/00*
U.S. Cl. 148—6.17 **8 Claims**

1. A method of treating aluminum surfaces to improve the corrosion resistance thereof which comprises contacting said surfaces with a liquid containing an N-alkyl-fluoroaliphaticsulfonamidophosphonic acid or the salt thereof.

4,202,707
FLAME CUTTING APPARATUS AND METHOD

Franz Hennecke, Arnsberg, Fed. Rep. of Germany, assignor to I. P. U. Limited, Nassau, The Bahamas

Filed Mar. 29, 1979, Ser. No. 25,044
Claims priority, application Fed. Rep. of Germany, Mar. 29, 1978, 2813461
Int. Cl.[2] B23K 7/02
U.S. Cl. 148—9 R 15 Claims



1. A method of flame cutting steel slabs or the like in strip casting apparatus, in which a flame cutting machine moves at the strip casting speed during the flame cutting, which method comprises so adapting the flame cutting speed to the casting speed automatically taking into account any temporary delay in the cutting operation so that at the termination of the flame cutting a definite predetermined distance of accompaniment is maintained.

4,202,708
CORROSION RESISTANT COPPER BASE ALLOYS FOR HEAT EXCHANGER TUBE

John F. Bates, Lake Charles, La., and James M. Popplewell, Guilford, Conn., assignors to Olin Corporation, New Haven, Conn.

Division of Ser. No. 879,145, Feb. 21, 1978, Pat. No. 4,171,972.
This application Dec. 13, 1978, Ser. No. 968,885
Int. Cl.[2] C22C 9/06; C22F 1/08
U.S. Cl. 148—11.5 C 14 Claims

1. A method of producing a wrought copper base alloy which is particularly useful in applications requiring corrosion resistance, said process comprising the steps of:
(a) providing an aluminum free cast alloy consisting essentially of 8 to 20% by weight zinc, 3 to 7% by weight nickel, 0.3 to 5% by weight iron, balance copper;
(b) homogenizing said alloy at a minimum temperature of 500° C. for at least 15 minutes;
(c) hot working said alloy with a finishing temperature of at least 400° C.;
(d) rapidly cooling the hot worked alloy from said finishing temperature to provide a single phase solid solution microstructure within the alloy; and
(e) cold working said alloy at a temperature below 200° C.

4,202,709
METHOD FOR MANUFACTURING ALUMINUM OR ALUMINUM ALLOY CLAD STEEL SHEET OR STRIP

Seiji Shibamori, and Yoji Ishida, both of Nikko, Japan, assignors to Furukawa Aluminum Co., Ltd., Tokyo, Japan

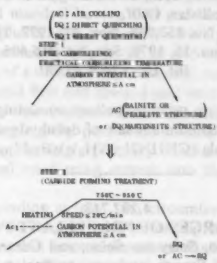
Filed Mar. 12, 1979, Ser. No. 19,712
Claims priority, application Japan, Mar. 10, 1978, 53/27280; Nov. 15, 1978, 53/140660
Int. Cl.[2] C22F 1/04
U.S. Cl. 148—11.5 Q 6 Claims

1. A method for manufacturing an aluminum or aluminum alloy clad steel sheet wherein an aluminized steel sheet which is obtained by applying aluminum or an aluminum alloy to a steel sheet by hot dipping is heated up to a temperature between 100° and 550° C.; then, an aluminum or aluminum alloy sheet which has room temperature and has a bonding face thereof cleaned is superposed on one side or on each of two sides of said aluminized steel sheet; and the superposed sheets are together subjected to a rolling process which is carried out at a draft reduction percentage between 10 and 40% to roll-bond said aluminum or aluminum alloy sheet or sheets with said steel sheet.

4,202,710
CARBURIZATION OF FERROUS ALLOYS

Takeshi Naito, Hiratsuka, and Yasutada Kibayashi, Machida, both of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Dec. 1, 1978, Ser. No. 965,433
Int. Cl.[2] C21D 1/48
U.S. Cl. 148—16.5 3 Claims



1. A method for carburizing low alloy steels having carbon content of no more than about 0.5%, which method comprises the steps of:
(a) pre-carburizing said steel in a carburizing atmosphere having a carbon potential of less than Acm to produce a carburized case having hypereutectoid composition;
(b) cooling said steel to transform the case into a bainite, pearlite or martensite structure; and
(c) carburizing said steel by heating thereof to a carburizing temperature for a sufficiently long time to produce carbides in a spheroidal or spherical form by employing carbides in the bainite or pearlite as nuclei or dissolving the martensite by heating to produce carbide particles and employing thereof as nuclei, said carburizing being carried out in such a manner that the heating speed of said steel is being controlled under 20° C. per minute in a region from Ac_1 temperature to 750° C.–950° C. and the carbon potential in the carburizing atmosphere is being maintained over Acm when the temperature is over Ac_1.

4,202,711
PROCESS FOR PRODUCING ORIENTED SILICON IRON FROM STRAND CAST SLABS

Martin F. Littmann, Middletown, Ohio, and Allan R. Obman, Valencia, Pa., assignors to Armco, Incl., Middletown, Ohio

Filed Oct. 18, 1978, Ser. No. 952,313
Int. Cl.[2] H01F 1/04
U.S. Cl. 148—111 14 Claims

1. A process for producing grain oriented silicon iron from strand cast slabs having uniformly high permeability and low core loss, which comprises the steps of melting a ferrous charge, refining said charge to obtain a melt consisting essentially of, in weight percent, 0.030% to 0.045% carbon, about 0.04% to about 0.08% manganese, about 0.015% to about 0.025% sulfur and/or selenium, not more than 0.003% titanium, not more than 0.005% nitrogen, residual oxygen, and

balance essentially iron, adding sufficient silicon to provide a range of 2.5% to 4.0% silicon and sufficient aluminum to combine with oxygen in the melt and obtain an oxygen content of not more than 0.005%, casting the melt into a slab thickness of about 125 to about 225 mm, cutting into suitable lenghts, reheating the slabs within the range of about 1330° to about 1400° C., hot rolling to band thickness, cold rolling to an intermediate thickness, annealing at about 850° to about 950° C., cold rolling to final thickness, decarburizing in a hydrogen-containing atmosphere, applying an annealing separator coating to the surfaces of the cold rolled, decarburized material, and subjecting the material to a final anneal in a hydrogen-containing atmosphere for a period of time sufficient to effect secondary recrystallization.

4,202,712

PROPELLANT AND PYROTECHNIC WITH AMINO-SUBSTITUTED GUANIDINE SALTS OF DECAHYDRODECABORIC ACID

Terrence P. Goddard, Apto, Calif., assignor to Teledyne McCormick Selph, Hollister, Calif.

Division of Ser. No. 853,918, Nov. 22, 1977. This application Jun. 16, 1978, Ser. No. 916,406

Int. Cl.² C06B *43/00*

U.S. Cl. 149—22 **4 Claims**

1. A high energy monopropellant consisting essentially of the monoaminoguanidinium salt of decahydrodecaboric acid, having the formula $(CNHNH_2(NH_2)_2)_2B_{10}H_{10}$.

4,202,713

UNIT CHARGES OF PROPELLANT POWDER

Philippe R. Ragon, Soisy sur Seine, and Gerard Van Vooren, Elbeuf, both of France, assignors to Societe Nationale des Poudres et Explosifs, Paris, France

Filed Dec. 14, 1977, Ser. No. 860,325

Claims priority, application France, Dec. 20, 1976, 76 38326

Int. Cl.² C06B *25/20*

U.S. Cl. 149—100 **11 Claims**

1. A unit charge of propellant powder, of potential energy essentially as pure nitrocellulose, free of energetic agents and free of thermosetting resin binders, capable of fragmenting and burning instantly, which consists essentially of grains of nitrocellulose agglomerated together by means of a gelatinizing plasticizer for said nitrocellulose, said plasticizer causing the ordered structure of the nitrocellulose to disappear irreversibly at a temperature between 40° and 100° C., said plasticizer having a melting point of up to 80° C. and being in an amount between 3 and 7% based on the weight of said nitrocellulose.

4,202,714

BALLISTIC MODIFIERS AND SYNTHESIS OF THE BALLISTIC MODIFIERS

Bernard J. Alley, Huntsville; James D. Dake, Redstone Arsenal, and Hiram W. H. Dykes, Huntsville, all of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Division of Ser. No. 58,133, Sep. 11, 1970. This application Dec. 20, 1972, Ser. No. 316,600

Int. Cl.² C06B *23/00*

U.S. Cl. 149—109.4 **18 Claims**

12. A ballistic modifier composition, for use in solid propellants, said ballistic modifier composition consisting of the reaction product formed by mixing different metal ions selected from the group consisting of lead, copper, silver, cobalt, nickel, zinc and bismuth with from one to two chelating agents in the presence of a reaction liquid selected from the group consisting of water, acetone and alcohol to produce a reaction slurry; stirring said reaction slurry until a constant pH is obtained; and filtering said reaction slurry to separate the reaction product.

4,202,715

METHOD FOR MAKING A SPHERICAL MIRROR

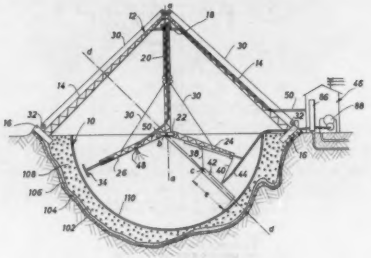
Georg Ziemba, Langenäckerstr 29, 7462 Frommern, Fed. Rep. of Germany

Filed May 25, 1977, Ser. No. 800,571

Claims priority, application Fed. Rep. of Germany, Jun. 2, 1976, 2624672

Int. Cl.² G02B *5/08*; E04F *13/00*

U.S. Cl. 156—71 **5 Claims**



1. A method of producing a large spherical mirror for use in converting solar energy into technically useable energy comprising:

(a) preparing a depression having a shape approximating that of a hemisphere;

(b) applying a hardenable fortifying layer to the depression;

(c) applying a transition layer over said fortifying layer;

(d) applying a solidifiable foam layer over said transition layer;

(e) shaping said foam layer to form a hemisphere; and

(f) cementing a finished mirror layer to said solidified foam layer.

4,202,716

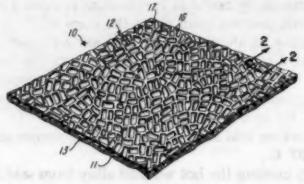
WALL COVERING AND METHOD OF MAKING SAME

Charles A. Roman, Lake Hopatcong, N.J., assignor to Dayco Corporation, Dayton, Ohio

Division of Ser. No. 892,053, Mar. 31, 1978. This application Mar. 21, 1979, Ser. No. 22,535

Int. Cl.² B32B *31/20*

U.S. Cl. 156—79 **10 Claims**



1. A method of making a lightweight wall covering having a weight of less than 14 ounces per square yard and having a substantially smooth inside surface and a deep textured outer layer comprising the steps of, providing a substrate having an exposed surface which is adapted to define said inside surface, bonding a fluid impervious film against said substrate, disposing a controlled thickness of liquid vinyl plastisol containing a chemical blowing agent against said film, subjecting said liquid vinyl plastisol and its supporting substrate and film to a controlled temperature to activate said blowing agent and thus define an expanded vinyl plastisol, and embossing said expanded vinyl plastisol immediately after activation of said blowing agent to form said textured outer layer defined by

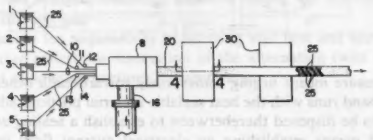
alternating recesses and projections substantially free of air spaces, said air spaces constituting less than 10 percent of the volume of said textured outer layer, said embossing step providing said textured outer layer while simultaneously providing a substantially fluid impervious skin in said textured outer layer, said substrate and film once bonded together following said bonding step having a combined thickness which is roughly 10 mils and less, said embossing step defining said projections having a maximum thickness measured from the interface of said textured outer layer with said film which is within the range of roughly 3 to 12 times said combined thickness and defines said deep texture in said textured outer layer.

4,202,717

PRE-CURING BEAD WIRE COATING

Theophilus K. Seiberling, Akron, Ohio, assignor to Mildred Kelley Seiberling and Frances S. Voke, both of Akron, Ohio

Filed Sep. 13, 1976, Ser. No. 722,903
Int. Cl.[2] B29H *17/34*
U.S. Cl. 156—136 **6 Claims**



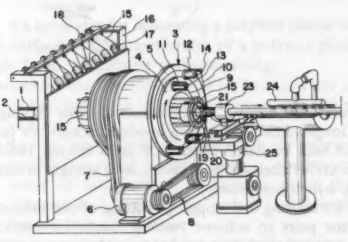
1. The process of producing a bead core for a pneumatic tire, comprising the steps of producing a tape consisting of an array of coplanar parallel flexible essentially inextensible tensile elements completely surrounded by rubber which contains heat-responsive curing ingredients and is also curable by electron irradiation, and subjecting both sides of the tape to electron irradiation, or other irradiation having the same curing effect on the rubber, to an extent increasing the firmness but not completely curing the rubber, coiling a plurality of convolutions of the tape into a ring of the size needed for the bead core, building the coil into a pneumatic tire with the margins of the plies turned around the bead coil, and heat-vulcanizing the assembly.

4,202,718

METHOD OF AND APPARATUS OF MANUFACTURING A FIBER-REINFORCED PRESSURE HOSE

Tadashi Mizutani, Osaka, and Hiromichi Tachibana, Ogaki, both of Japan, assignors to Kuraray Plastics, Co., Ltd., Osaka, Japan

Filed Dec. 6, 1977, Ser. No. 857,909
Claims priority, application Japan, Dec. 9, 1976, 51-148978
Int. Cl.[2] B65H *81/00*
U.S. Cl. 156—171 **27 Claims**



1. A method of manufacturing a fiberreinforced pressure hose, which comprises the steps of:

forming a reinforcing layer on an elongated mandrel of a construction which has a first and second end and an outer peripheral surface formed with a plurality of guide grooves extending lengthwise of said mandrel, said mandrel being of substantially truncated conical shape tapering from said first end towards said second end thereof at a predetermined angle of convergence, the formation of the reinforcing layer being carried out by guiding a plurality of longitudinal reinforcing strands along the guide grooves on the mandrel in one direction while at least two circumferential reinforcing strands are wound on the longitudinal reinforcing strands on a section of the mandrel intermediate said first and second ends thereof and spirally in opposed direction to each other;

drawing the reinforcing layer outwards from said second end of said mandrel; and

supplying a resinous material to the reinforcing layer at a position outside of and longitudinally spaced from said mandrel to form a tubular product with the reinforcing layer embedded therein while the reinforcing layer being formed is continuously drawn away from the mandrel.

20. An apparatus for manufacturing a fiber-reinforced pressure hose, which comprises, in combination:

an elongated mandrel having first and second ends and an outer peripheral surface formed with a plurality of guide grooves extending lengthwise of said mandrel, said mandrel being of a substantially truncated conical shape tapering from said first end toward said second end thereof at an angle of convergence within the range of 0.5° to 10°;

a balance ring rigidly positioned to said first end of said mandrel and having a plurality of axial holes for guiding longitudinal reinforcing strands into the grooves of the mandrel;

means for winding at least two circumferential reinforcing strands on the longitudinal reinforcing strands on a section of said mandrel intermediate said first and second ends thereof and spirally in opposed directions to each other to form a substantially tubular reinforcing layer;

means for supplying a resinous material in a molten state toward said second end of the mandrel;

means defining an annular orifice for forming a tubular product from said resinous material with the reinforcing layer embedded therein, said annular orifice being disposed outside of and longitudinally spaced from said mandrel; and

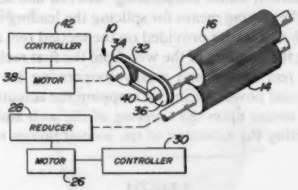
means for drawing the tubular product being so manufactured.

4,202,719

SINGLE FACER DRIVE

S. Stephen Linn, Marlton, N.J., assignor to Molins Machine Company, Inc., Cherry Hill, N.J.

Filed Apr. 10, 1978, Ser. No. 894,793
Int. Cl.[2] B31F *1/28*; B32B *31/12*; B65H *17/12*; B31F *1/26*
U.S. Cl. 156—205 **9 Claims**



1. In a single facer machine for producing an endless web of single faced paperboard having transverse crests comprising first and second corrugating rolls having longitudinally extending flutes in mesh, the improvement comprising motor means independently connected to each roll for separately rotating said rolls in opposite directions at substantially the same speed and without gearing said rolls directly together so

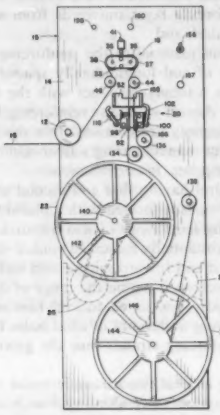
that said rolls may corrugate a web passing therebetween with minimal tension on the web.

4,202,720

WEB CUTTING AND SPLICING APPARATUS

Theodore R. Hughes, Tulsa, Okla., and Glenn L. McCarty, 6319 S. 45 W. Ave., Tulsa, Okla. 74132, assignors to Glen L. McCarty, Tulsa, Okla.

Filed Jun. 21, 1977, Ser. No. 808,448
Int. Cl.[2] B26D *5/00*
U.S. Cl. 156—353 **9 Claims**



1. Web cutting and splicing apparatus comprising pulley means for initially receiving the web therearound, braking means spaced from the pulley means for receiving the web therethrough, at least one actuator cooperating between the web and the braking means for selective actuation of the braking means to momentarily hold the web against longitudinal movement, cutting means spaced from the braking means for receiving the web therethrough, means operably connected with the cutting means for actuation simultaneously with the braking means for severing the web at a predetermined position thereon, first reel means spaced from the cutting means for receiving the leading end of the web thereon, first power means operably connected with the first reel means for selective rotation thereof to move the web from the pulley means to the first reel means for winding the web thereon, second reel means journalled in spaced relation to the first reel means, second power means operably connected with the second reel means for selective rotation thereof, means operably connected between said first and second power means for alternate actuation thereof, means cooperating between said second reel means and the cutting means for splicing the leading end of the severed web to a leader provided on the second reel means for transferring the winding of the web from the first reel means to the second reel means, and means cooperating between the first and second power means for stopping the actuation of the first power means upon the severing of the web and simultaneously starting the actuation of the second power means.

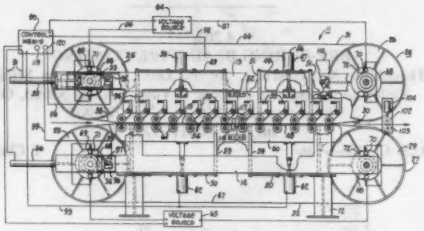
4,202,721

HEAT SEALING MECHANISM

John P. Roberts, Cantonment, Fla., assignor to St. Regis Paper Company, West Nyack, N.Y.

Filed Jan. 26, 1978, Ser. No. 872,669
Int. Cl.[2] B32B *31/00*; B30B *15/34*; B02C *11/08*; H05B *1/00*
U.S. Cl. 156—358 **8 Claims**

1. A sealing mechanism comprising, in combination,
conveyor means adapted to move first and second portions of heat sealable material in juxtaposed relationship in a first path,
said conveyor means including pulley means,
a rotatable hub and a band guiding surface on said pulley means,
insulating means relatively insulating said rotatable hub and said band guiding surface,
metal band means trained around said band guiding surface of said pulley means to establish first and second band runs on opposite sides of and along said first path,



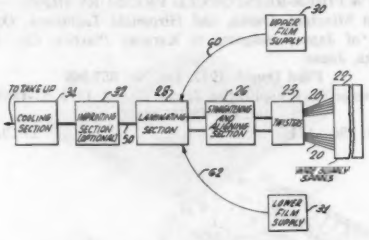
pressure means urging transversely toward each other said band runs with the heat sealable material portions adapted to be disposed therebetween to establish a sealing zone,
and means establishing an electrical current flow in said band guiding surface and into at least part of said metal band runs to heat said part and conduct heat in said sealing zone to said heat sealable material portions to cause said portions to be sealed together under heat and pressure.

4,202,722

APPARATUS FOR MAKING TWISTED PAIR MULTI-CONDUCTOR RIBBON CABLE WITH INTERMITTENT STRAIGHT SECTIONS

Patrick J. Paquin, Hamden, Conn., assignor to Spectra-Strip, Garden Grove, Calif.

Division of Ser. No. 725,539, Sep. 22, 1976, Pat. No. 4,096,006.
This application Mar. 13, 1978, Ser. No. 885,780
Int. Cl.[2] H01B *13/00*
U.S. Cl. 156—436 **19 Claims**



1. Apparatus for making multiconductor cable having a plurality of longitudinally extending insulated conductor pairs with each of said insulated conductor pairs having twisted conductor portions alternating, in series, with straight conductor portions, which comprises:
(a) means for starting and stopping twisting of said insulated conductor pairs to achieve twisted conductor portions having a twist length of a predetermined distance;
(b) means for maintaining the conductors of each of said insulated conductor paris as straight conductor portions for a predetermined distance after said stopping of twisting occurs;
(c) means for supplying first and second sheets of plastic film

to opposite sides of said insulated conductor pairs to encapsulate both said twisted conductor portions and said straight conductor portions of said insulated conductor pairs therebetween upon subsequent lamination of said sheets of plastic film;

(d) means for laminating said sheets of plastic film to encapsulate both said twisted conductor portions and said straight conductor portions of said insulated conductor pairs between said sheets and to thereby form said multiconductor cable including:

(i) means for precisely laterally aligning said twisted conductor portions during their lamination having a first laminating roller formed with a series of channels therein for precise lateral spacing of each twisted conductor portion during lamination of the twisted conductor portions of the cable, and

(ii) means for maintaining precise alignment of said straight conductor portions of the cable during lamination having a second laminating roller formed with a series of channels therein for precise lateral spacing of said straight conductor portions during the lamination thereof; and

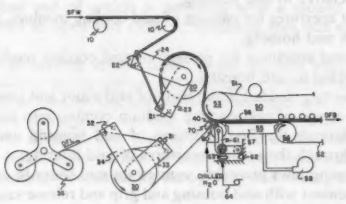
(e) means for sequentially positioning said first and second laminating rollers for lamination of the alternating twist and straight conductor portions, respectively.

4,202,723

AUTOMATICALLY CONTROLLED MACHINE FOR MAKING DOUBLE-FACE, POLYMER PLASTIC COATED, CORRUGATED PAPERBOARD

Partha S. Chaudhuri, Covington, Va., assignor to Westvaco Corporation, New York, N.Y.

Division of Ser. No. 758,040, Jan. 10, 1977, Pat. No. 4,071,392.
This application Oct. 11, 1977, Ser. No. 840,768
Int. Cl.[2] B31F *5/00*
U.S. Cl. 156—470 **3 Claims**



1. An apparatus for laminating a polymer plastic coated liner web surface to flute tip surfaces of a polymer plastic coated, single faced, corrugated web comprising:

means for heating said flute tip surfaces and one surface side of said liner web to a tacky state of said polymer plastic coatings;

a bonding nip between an endless belt carrying pulley and a cylindrical roller located along a continuous traveling route of said webs at a junction point therebetween whereat said heated liner web side is joined with said heated flute tip surfaces;

pneumatic spring means for resiliently holding said roller against said nip;

pressure control means for selectively changing the resilient holding force of said spring means; and,

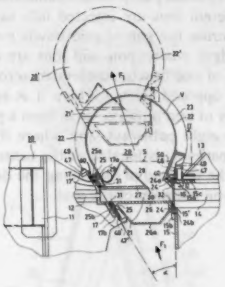
jack means between said roller and said spring means to selectively adjust the opening of said bonding nip.

4,202,724

QUICK CONNECT APPARATUS FOR HEADBOX COMPONENTS IN A PAPER MAKING MACHINE

Alvi Kirjavainen, Jyvaskyla, Finland, assignor to Valmet Oy, Finland

Filed Feb. 28, 1979, Ser. No. 16,147
Claims priority, application Finland, Mar. 2, 1978, 780711
Int. Cl.[2] D21F *1/02*
U.S. Cl. 162—272 **12 Claims**



1. In a paper making machine, quick connect apparatus for detachably locking a component of the headbox, such as the air cushion damping device, the distribution header, cover, and-/or bottom plate, into its operative position and for unlocking the same to permit detachment thereof so that the headbox may be serviced, said component to be locked having forward and rearward edge regions in the direction of pulp stock flow adapted to matingly engage with corresponding edge regions of other components to define respective joints therewith, comprising:

an elongated locking rod extending over the substantial length of at least one of the edge regions of said component to be detachably locked in position;

a plurality of spaced locking portions provided on said elongated locking rod adapted to lockingly engage at least one other component of said headbox at its respective joint; and

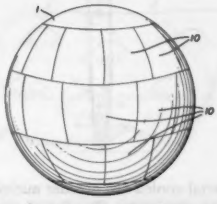
means for moving said elongated locking rod, said locking rod being movable such that said locking portions are movable out of said locking engagement with said other component to unlock the same by actuation of said moving means.

4,202,725

CONVERGING BEAM FUSION SYSTEM

William S. Jarnagin, P.O. Box 127, Concord, Mass. 01742

Filed Mar. 8, 1978, Ser. No. 884,482
Int. Cl.[2] G21B *1/00*
U.S. Cl. 176—5 **1 Claim**



1. A converging beam nuclear fusion system comprising a plurality of diametrically opposed wedges joined to form a spherical reaction chamber, said wedges having an interior surface positioned at a predetermined fixed distance from the center of said chamber so as to form an interior spherical space;

a first plurality of said wedges containing electromagnet means of C-shape cross section, a second plurality of said wedges containing magnetic mirror means, two hemispherical electrically conductive bowls located in the interior spherical space so as to form a gap therebetween, said bowls each having at least one perforation; a high frequency high voltage power source connected across said bowls; at least one ion injection means operatively connected to at least one of said bowls, at least one output means operatively connected to at least one of said bowls, a vacuum pump means connected to said reaction chamber, wherein ions are injected into said bowls, therein accelerated across the gap of said bowls toward one of said spherical wedges whereupon said ions are deflected and returned to one of said bowls, accelerated across said gap to the diametrically opposed wedge where it is again deflected to return to other of said bowls so as to form a plurality of beams having figure eight pathways, and where the intersection of each FIG. 8 pathway is located at the center of the reaction chamber for the purpose of enhancing the density and probability of head-on collision of the ions.

4,202,726

LIQUID METAL COOLED FAST BREEDER NUCLEAR REACTORS

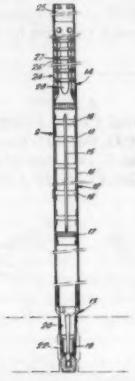
Edward Duncombe, Hale, and Gordon Thatcher, Warrington, both of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Nov. 28, 1978, Ser. No. 964,350

Claims priority, application United Kingdom, Dec. 12, 1977, 51635/77; Jan. 10, 1978, 904/78

Int. Cl.[2] **G21C** *15/00*

U.S. Cl. 176—18 **4 Claims**



1. A liquid metal cooled fast breeder nuclear reactor having a fuel assembly comprising a plurality of elongate sub-assemblies upstanding in side-by-side array, the sub-assemblies in an outer zone of the fuel assembly each having an electro-magnetic braking device for regulating the flow of coolant through the sub-assembly, the magnetic fields of the electro-magnetic braking devices being temperature sensitive.

4,202,727

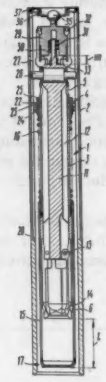
GRIPPING MEANS FOR FUEL ASSEMBLIES OF NUCLEAR REACTOR

Vladimir I. Batjukov, ulitsa Prygunova, 9, kv. 29; Oleg N. Vjugov, ulitsa Novaya, 24, kv. 2; Alexandr I. Fadeev, ulitsa Engelsa, 21, kv. 46; Alexandr F. Shapkin, ulitsa Zvezdinka, 3, kv. 64, and Lev E. Dyatlov, ulitsa Kuibysheva, 45, kv. 53, all of Gorky, U.S.S.R.

Filed Sep. 22, 1977, Ser. No. 835,582

Int. Cl.[2] **G21C** *19/20;* **B66C** *17/08, 1/10*

U.S. Cl. 176—30 **4 Claims**



1. A gripping means for fuel assemblies of a nuclear reactor, which have heads of the type that includes a cylindrical portion conjugated with a contact surface, an internal cavity and at least one aperture for passage of a cooling medium into said internal cavity, which aperture is provided in said cylindrical portion of the fuel assembly head, comprising:

a housing having an outer surface;

a sealing member secured on said outer surface of said housing;

a slider accomodated in said housing and adapted for motion relative to said housing;

first apertures for passage of said cooling medium, provided in said housing;

second apertures for passage of said cooling medium, provided in said housing;

a cavity provided in the body of said slider and intended for passage of said cooling medium coming into said cavity through the first apertures of said housing and exiting through the second apertures of said housing;

gripping jaws pivotably secured on said slider to come into contact with said housing and grip and release said head of said fuel assembly as said slider and said housing move in relation to each other;

a casing mounted on said housing, adapted for motion in relation to said housing and having an internal cavity, a first end face and a second end face;

a spring arranged on said outer surface of said housing, having a first end and a second end and interacting with its first end with the first end face of said casing;

a cap mounted on the second end face of said casing and having an end face whose shape corresponds to that of said contact surface of said head of said fuel assembly;

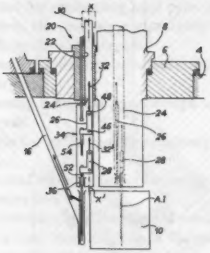
the length of said casing being selected so that as said gripping jaws grip said head of said fuel assembly, said end face of said cap comes into contact, under the action of said spring, with said contact surface of said head, thus forming a closed circuit for passage of said cooling medium through said internal cavity of said casing and through said aperture of said head into said internal cavity of said fuel assembly.

4,202,728

DOUBLE-ARM HANDLING DEVICE FOR A NUCLEAR REACTOR

Albert Allain, Bruyeres-le-Chatel, and Jacqui Buret, Saulx-les-Chartreux, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Oct. 3, 1977, Ser. No. 838,476
Claims priority, application France, Oct. 15, 1976, 76 31059
Int. Cl.[2] G21C *19/20*; B66C *17/08, 1/10*
U.S. Cl. 176—30 2 Claims



1. A handling device for a nuclear reactor of the type comprising within a pressure vessel closed by a top shield slab provided with at least one rotating shield plug, a reactor core constituted by a plurality of fuel assemblies and a handling flask for receiving a fuel assembly, wherein said device comprises:

a vertical body having a vertical axis, the upper end of said body passing through said shield plug, and means for driving said body in rotation about said axis with respect to said shield plug,

a first carriage provided with a first horizontal arm, the free end of which is provided with a first grab adapted to open and close for gripping said fuel assemblies,

a first guiding means rigidly fixed to said body and adapted to guide said first carriage in vertical translational motion so that the first horizontal arm of said first carriage is movable in a first vertical plane,

a second carriage provided with a second horizontal arm, the free end of which is provided with a second grap adapted to open and close for gripping said fuel assemblies,

a second guiding means rigidly fixed to said body and adapted to guide said second carriage in vertical translational motion so that the second horizontal arm of said second carriage is movable in a second vertical plane distinct from the first vertical plane, and so that said second arm remains parallel to said first arm, and means for controlling independently the opening and closing of said grabs.

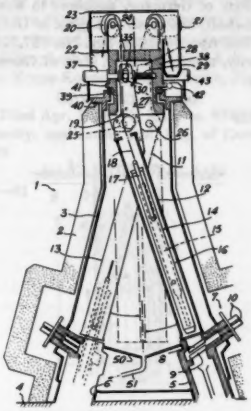
4,202,729

DEVICE FOR THE CHARGE AND DISCHARGE OF NUCLEAR REACTION FUEL ASSEMBLIES

Albert Allain, Bruyeres-le-Chatel; Jacqui Buret, Saulx les Chartreux, and André Plagnard, Montrouge, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Oct. 3, 1977, Ser. No. 839,032
Claims priority, application France, Oct. 15, 1976, 76 31060
Int. Cl.[2] G21C *19/20*; B66C *17/08, 1/10*
U.S. Cl. 176—30 6 Claims

1. A device for the charge and discharge of fuel in a nuclear reactor provided with a reactor vessel and a top closure slab, said device comprising a leak-tight lock chamber placed over said top closure slab and fixed to said slab, first and second guide ramps passing through said slab, the upper end of said ramps opening into said chamber, said ramps communicating respectively with said reactor vessel and with an external storage container and being sealable by means of valves, a revolving unit having a vertical axis located within said chamber, first and second rectilinear rail sections adapted to receive a moving system together with a fuel assembly to be charged and discharged, said rail sections being carried by said revolving unit, said moving system being capable of displacement in sliding motion along each guide ramp under the action of a drive winch placed at the top of said lock chamber, means for rotating each rail section around a horizontal shaft carried by said revolving unit between a first inclined position within the extension of one of said guide ramps and a second vertical



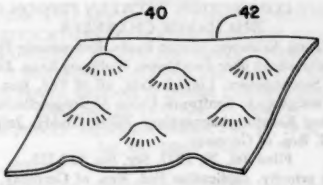
position, said rotating means comprising a lever which forms an extension of said rail section beyond the shaft thereof, and rocking means adapted to cooperate with said lever to displace said rail section from one position to the other one, and means for rotating said revolving unit around said vertical axis only when said two rail sections are in the second vertical position, said leak-tight lock-chamber having in horizontal cross section an elongated shape the greatest dimension corresponding to the position of the upper ends of said guide ramps, the lowest dimension corresponding to the two rail sections in the second vertical position.

4,202,730

RADIONUCLIDE DEPOSITION CONTROL

William F. Brehm, and Joseph C. McGuire, both of Richland, Wash., assignors to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Jan. 18, 1977, Ser. No. 760,302
Int. Cl.[2] G21C *15/00*
U.S. Cl. 176—37 13 Claims



1. A method for controlling deposition onto component surfaces of radionuclides manganese-54, cobalt-58 and cobalt-60 from a liquid metal stream containing said radionuclides and contacting said component surfaces, comprising disposing a getter material in said liquid metal stream with surfaces of said getter material contacting said liquid metal stream to chemi-

cally getter said radionuclides onto said getter material, wherein said getter material comprises at least 73 weight percent nickel.

4,202,731

CONDENSATION TUBE FOR A BLOW-OFF DEVICE FOR LIMITING EXCESS PRESSURE IN NUCLEAR POWER PLANTS, ESPECIALLY IN BOILING WATER NUCLEAR POWER PLANTS

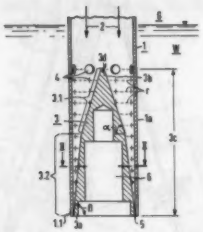
Ulrich Simon, Frankfurt am Main-Oberrad; Klaus-Dieter Werner, Frankfurt am Main-Langen, and Bernd Pontani, Alzenau, all of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

Filed Apr. 14, 1977, Ser. No. 787,324

Claims priority, application Fed. Rep. of Germany, Apr. 15, 1976, 2616831

Int. Cl.[2] G21C *9/00*

U.S. Cl. 176—37 **8 Claims**



1. In a blow-off device for limiting excess pressure in nuclear power plants, a condensation tube disposed so that a lower outlet end thereof is immersed in a volume of water in a condensation chamber having a gas cushion located in a space above the volume of water, and an upper inlet end of the condensation tube extends out of the volume of water and is connectible to a source of steam that is to be condensed or a steam-air mixture, the outlet end of the tube, for stabilizing the condensation, being provided with a base member at the mouth of the tube permanently closing said tube mouth against discharge of steam flows in axial direction of the tube, and being formed with lateral outlet openings for discharging and for subdividing the steam flow and the bubbles produced in the volume of water so as to discharge the steam substantially transverse to the axis of the tube, the base member at the tube mouth being formed as a conical insert member having a base fastened to the condensation tube in vicinity of the mouth thereof and having an apex extending into the tube mouth, the lateral outlet discharge openings being disposed at least within the axial range of the insert member.

4,202,732

TIGHT CONNECTION BETWEEN FISSION GAS DISCHARGE CHANNELS

Wilfried Jung, Erlangen; Martin Peehs, Bubenreuth; Peter Rau, Mittelehrenbach über Forchheim; Wolfgang Krug, Jülich, and Horst Stechemesser, Linnich-Tetz, all of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim and Kernforschungsanlage Jülich GmbH, Julich, both of, Fed. Rep. of Germany

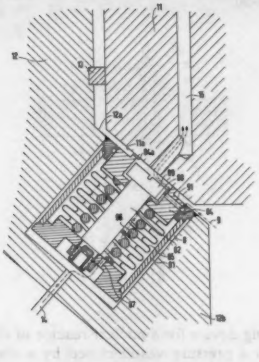
Filed Jul. 20, 1977, Ser. No. 817,223

Claims priority, application Fed. Rep. of Germany, Jul. 23, 1976, 2633192

Int. Cl.[2] G21C *3/16*

U.S. Cl. 176—37 **3 Claims**

1. In a gas-cooled nuclear reactor, a tight connection having an intentionally provided leak site between a fission-gas discharge channel formed in a reactor core carrying plate as well as in a head portion of encased fuel elements that are suspended in receiving bores formed in the core carrying plate, the tight connection being formed by an annular member having a sealing surface engaging the core carrying plate at a region thereof in which an opening to the fission-gas discharge channel formed in the core carrying plate is located, a gas-tight, elastic and substantially cylindrical member, variable in length, connecting said annular member to the fission-gas discharge channel formed in the head portion of the fuel element, compression spring means biasing said annular member in a direction away from the fission gas discharge channel formed in the fuel-element head portion, and a sealing abutment plate secured to a central pin and limiting clearance for play of said annular member with respect to an annular zone thereof disposed within said sealing surface of said annular member, the leak site comprising a radial bore formed in and extending through said annular member between said annular zone and said sealing surface of said annular member.



4,202,733

PROCESS AND APPARATUS FOR PREHEATING COAL INTENDED FOR USE IN COKING INSTALLATIONS

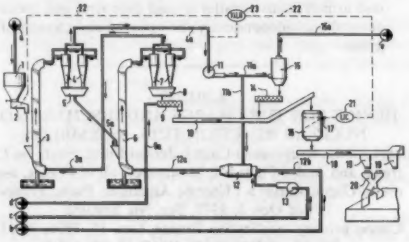
Willy Lüke, Düsseldorf, and Günter Gabriel, Bochum, both of Fed. Rep. of Germany, assignors to Bergwerksverband GmbH and Didier Engineering GmbH, both of Essen, Fed. Rep. of Germany

Filed Nov. 7, 1978, Ser. No. 959,186

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1977, 2750513

Int. Cl.[2] C10B *57/10, 31/00, 29/00, 45/00*

U.S. Cl. 201—1 **6 Claims**



1. A process of preheating coal prior to passing it into a coking installation, the said process comprising

feeding measured amounts of a relatively wet coal into and through at least one flow-through dryer heated by a heat carrier gas to an elevated temperature;

collecting the relatively dry hot coal in a collecting bin before passing the coal into the coking installation;

automatically measuring the level of the hot coal accumulated in said bin;

automatically adjusting the amount of coal fed per unit of time into said at least one dryer as a function of the level of coal measured in said collecting bin;

measuring the temperature of the exhaust gas expelled from said at least one dryer; and

automatically shutting off further adjustments of said amount of coal as the temperatures of the exhaust gas indicated by said measurement are below a predetermined minimum or above a predetermined maximum.

4. An apparatus for preheating coal prior to passing it into a coking installation, the said apparatus comprising

at least one flow-through dryer;

feeding means for charging relatively wet coal into said at least one dryer;

means for passing a heating gas through said dryer together with said coal;

a collecting bin for receiving the relatively dry hot coal from said dryer;

means for measuring the level of the hot coal accumulated in said collecting bin;

means for automatically adjusting the amount of coal fed per unit of time into said dryer as a function of the level of coal measured in said collecting bin;

a temperature sensor for measuring the temperature of the gas expelled from said dryer or one of said dryers; and

automatic lock and release means for keeping the said adjustment of the charge constant in response to said temperature sensor when the temperature of the exhaust gas is above or below said temperature limits and for reinstating the adjustment means when said temperature is again within the range of said temperature limits.

4,202,734

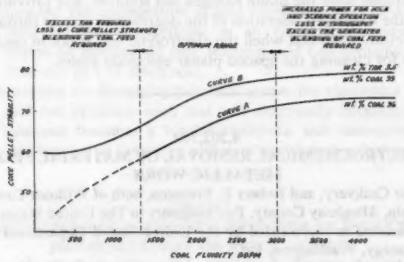
METHOD FOR PRODUCING CALCINED COKE PELLETS

Robert R. Greenbaum, Coopersburg, Pa., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Feb. 14, 1978, Ser. No. 877,635

Int. Cl.[2] C10B *45/02, 53/08, 57/04*

U.S. Cl. 201—6 **10 Claims**



1. An improved method for producing calcined coke agglomerates having a stability index of not less than 60 percent from coals and blends of coals comprising:

(a) adjusting the fluidity of the coals and blends of coals to between 1300 DDPM and 3000 DDPM,

(b) charging a mix of the coals and blends of coals at a preheated temperature and char heated to a temperature higher than that of the coals and blends of coals into a rotating agglomerating drum,

(c) heating the coals and blends of coals by heat exchange from the char while agglomerating the mix in the rotating drum to form partially coked green coal agglomerates,

(d) discharging the partially coke green coal agglomerates from the rotating agglomerating drum,

(e) charging the partially coked green coal agglomerates into a calcining furnace, and

(f) heating the partially coked green coal agglomerates in the furnace for a time at a temperature to produce calcined coke agglomerates.

4,202,735

PROCESS FOR OPERATING COKING OVENS AND AN OVEN FOR USE IN SAID PROCESS

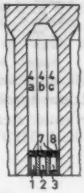
Heinz Dürselen, Essen-Überruhr; Franz-Josef Onnebrink, and Arnulf Schüffler, both of Essen, all of Fed. Rep. of Germany, assignors to Krupp-Koppers GmbH, Essen, Fed. Rep. of Germany

Filed Apr. 10, 1978, Ser. No. 894,848

Claims priority, application Fed. Rep. of Germany, Apr. 20, 1977, 2717499

Int. Cl.[2] C10B *5/12, 5/20*

U.S. Cl. 201—41 **10 Claims**



1. A process for operating a coking oven or a group of coking ovens wherein heating medium is furnished to the oven chambers from a bottom fire box of boxes and wherein regenerators or recuperators provide heat exchangers for waste gas, diluted gas or hot air, said process comprising passing the flow of waste gas or diluted gas or hot air through a plurality of parallel flow channels constituting the heat exchange surfaces of each regenerator or recuperator and reducing the portion of the total surfaces available for heat exchange in case of an extension of the coking time by throttling or shutting off the flow to at least one of said channels while operating the oven at normal output and adjusting the degree of said reduction of heat exchange surface to the degree of extension of coking time, whereby an excessive lowering of the temperature of discharged waste gas or air may be avoided.

4,202,736

PROCESS AND APPARATUS FOR THE THOROUGH PURIFICATION OF WATER AND THE HIGHLY PURIFIED WATER OBTAINED THEREBY

Herbert S. Marcovich, Saint-Cloud, and Remi D. Perrin, Paris, both of France, assignors to Institut Pasteur, Paris, France

Filed Jun. 13, 1977, Ser. No. 806,271

Claims priority, application France, Jun. 15, 1976, 76 18150

Int. Cl.[2] B01D *3/02*

U.S. Cl. 203—10 **31 Claims**

1. A distillation process for producing apyrogenic water which comprises the following steps:

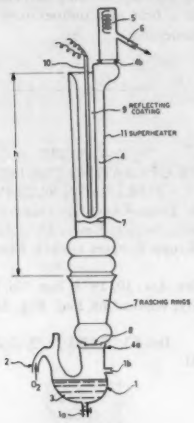
(a) introducing water into a heating zone,

(b) heating the water in the heating zone to convert it into steam,

(c) superheating the steam to a temperature within a range exceeding 300° C. and up to 700° C.,

(d) concurrently with step (c), passing the steam over and

between packing material inert at the temperature with respect to said steam and to any impurities therein and



thus maintaining the steam at said temperature for a dwell time sufficient to produce apyrogenic water, and

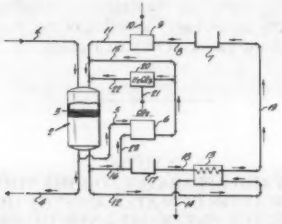
(e) condensing the superheated steam into apyrogenic water.

4,202,737

ION EXCHANGE PROCESS FOR DESALINATION

Hiroshi Shimizu, Tokyo, Japan, assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Aug. 2, 1978, Ser. No. 930,478
Int. Cl.[2] B01D *15/06*
U.S. Cl. 210—32 **14 Claims**



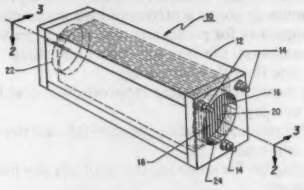
1. In an ion exchange process for desalination characterized by the steps of: (a) contacting an aqueous feed solution containing a salt of a strong acid with a thermally regenerable ion exchange resin having weakly acidic free acid groups and weakly basic free base groups whereby said resin is loaded with said salt by ion exchange and said feed solution is desalinated, (b) removing desalinated solution, and (c) thermally regenerating said resin and eluting from the resin the salt loaded thereon, the improvement which comprises converting said weakly basic free base groups to carbonate form weakly basic groups prior to or simultaneously with contact between said feed solution and said resin.

4,202,738

ELECTROLYTIC GENERATION OF HALOGEN BIOCIDES

Neil W. Stillman, Madison, Ohio, assignor to Diamond Shamrock Corporation, Dallas, Tex.

Division of Ser. No. 740,870, Nov. 11, 1976. This application May 12, 1978, Ser. No. 905,386
Int. Cl.[2] C25B *1/26*; C02C *5/12*
U.S. Cl. 204—95 **4 Claims**



1. A method for the production of halogen from a dilute halogen salt solution in an amount sufficient to produce a biocidally active agent for the treatment of a liquid comprising the steps of: adding a sufficient amount of halogen salt to the liquid to produce a concentration thereof greater than 0.5 grams per liter; placing in line with the liquid distribution system, an electrolytic cell having a plurality of spaced planar electrode plates attached to the electrolytic cell enclosure in parallel fashion across the entire cross-section area of the liquid distribution system line connected to the electrolytic cell so that the openings at opposing ends of the electrolytic cell are nearly as large as the height of the spaced planar plates, with each of the spaced planar electrode plates having coatings on one side thereof such that an ionic potential is promoted in one direction through each of the spaced planar electrode plates by an electrical power source connected to substantially less than all of the spaced planar electrode plates; providing a liquid flow through the electrolytic cell passed the spaced planar electrode plates in the range of 1 to 3 feet per second (304 to 914 mm per second); operating the electrolytic cell noncontinuously in accordance with a pre-determined desired effective level of the biocidally active agent as electrolytically produced from the dilute halogen salt solution; and providing for the continued operation of the distribution system through the electrolytic cell when the electrolytic cell is not in operation for cleaning the spaced planar electrode plates.

4,202,739

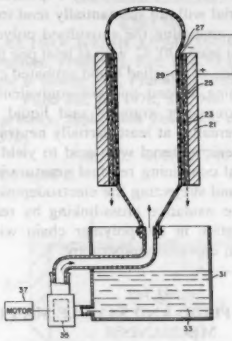
ELECTROCHEMICAL REMOVAL OF MATERIAL FROM METALLIC WORK

Tibor Csakvary, and Robert E. Fromson, both of Wilkens Township, Allegheny County, Pa., assignors to The United States of America as represented by the United Stated Department of Energy, Washington, D.C.

Filed Apr. 25, 1977, Ser. No. 790,226
Int. Cl.[2] B23P *1/00, 1/14*; C25F *7/00*
U.S. Cl. 204—129.35 **2 Claims**

1. The electrochemical machining method of removing material from metallic work with an electrolyte with apparatus including a deformable perforated electrically insulating web, a deformable perforated electrically conducting web, and a low voltage power supply, the said method comprising, placing said insulating web on said work so that it conforms with said work, placing said conducting web on said insulating web so that it is separated from, insulated with respect to, and conforms with said work, conducting said electrolyte through said webs to said work, responsive to the pressure exerted by said electrolyte applying pressure to said electrode to maintain the spacing between said electrode and work, and supplying a

high current from said supply between said conducting web and work to remove said material from said work, the voltage



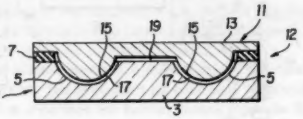
of said supply being so low that no arcing occurs between said conducting web and said work.

4,202,740

APPARATUS AND METHOD FOR DISINFECTING OBJECTS

Glenn E. Stoner, and George L. Cahen, Jr., both of Charlottesville, Va., assignors to Research Corporation, New York, N.Y.

Filed Feb. 6, 1978, Ser. No. 875,513
Int. Cl.[2] A61L *1/00*
U.S. Cl. 204—130 **26 Claims**



1. A method for disinfecting an object which comprises:
holding said object by an electrically conductive substrate,
immersing the combination of said object and said electrically conductive substrate in an electrolyte solution within an electrolytic cell, wherein said cell contains at least one pair of electrodes,
impressing an alternating potential across the electrodes of said cell sufficient such that said electrically conductive substrate becomes a bipolar electrode, and maintaining said bipolarism for a time sufficient to disinfect said object.

4,202,741

ENRICHMENT OF NITROGEN ISOTOPES BY INDUCED ISOMERIZATION OF ISOCYANIDES

Allen Hartford, Jr., Denville, and Sam A. Tuccio, Randolph, both of N.J., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Apr. 3, 1978, Ser. No. 893,099
Int. Cl.[2] B01D *59/00*; B01J *1/12*
U.S. Cl. 204—158 R **10 Claims**

1. A process for obtaining nitrile compounds which are enriched in a particular first elemental isotope which comprises exposing a gaseous organic isocyanide containing said first isotope and one or more other isotopes of the same element to infrared radiation of a predetermined wave length from a laser-based device which selectively isomerizes said isocyanide containing said first isotope to the corresponding nitrile without substantially isomerizing said isocyanide containing other isotopes of said element.

4,202,742

PHOTOPOLYMERIZATION OF ETHYLENICALLY UNSATURATED MONOMERS

Peter M. Castle, Penn Hills, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 30, 1979, Ser. No. 34,311
Int. Cl.[2] C08F *2/46, 4/00*
U.S. Cl. 204—159.23 **10 Claims**

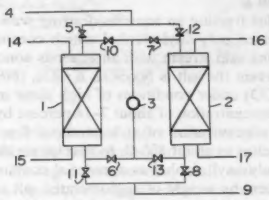
1. A method of photopolymerizing an ethylenically unsaturated monomer comprising
(1) preparing a composition of an ethylenically unsaturated monomer and at least about 0.1 mole percent of an inhibitor selected from the group consisting of parabenzoquinone, hydroquinone, and mixtures thereof, said composition being free of any photoinitiator; and
(2) irradiating said composition with light having a wavelength within the absorption band of said inhibitor, said wavelength being outside of the ultraviolet band.

4,202,743

ELECTROLYSIS OF AQUEOUS SOLUTION OF SODIUM CHLORIDE

Yoshio Oda; Manabu Suhara; Shoziro Goto; Takashi Hukushima, all of Yokohama; Koji Miura, Chohfu, and Toshikatsu Hamano, Yokohama, all of Japan, assignors to Asahi Glass Company, Limited, Tokyo, Japan

Filed May 2, 1978, Ser. No. 902,084
Claims priority, application Japan, May 4, 1977, 52-50685; Nov. 29, 1977, 52-142269
Int. Cl.[2] C25B *1/16, 1/26*
U.S. Cl. 204—98 **12 Claims**



1. In a process for producing sodium hydroxide by an electrolysis of an aqueous solution of sodium chloride by employing a fluorinated cation exchange membrane having an ion-exchange capacity of 0.8 to 2.0 meq/g dry polymer and having carboxylic acid groups as functional groups and maintaining a concentration of an aqueous solution of sodium hydroxide in a cathode compartment in a range of 20 to 45 wt.%, an improvement characterized by electrolyzing the aqueous solution of sodium chloride while maintaining a calcium concentration in the aqueous solution of sodium chloride lower than 0.08 mg/liter and a magnesium concentration lower than 0.04 mg/liter.

4,202,744

PRODUCTION OF HYDROGEN

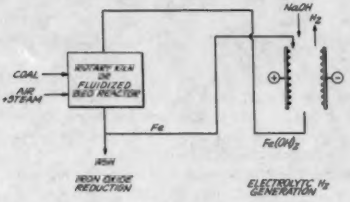
Yen-Chi Pan, Westfield, and John S. Batzold, Union, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed May 14, 1979, Ser. No. 38,925
Int. Cl.[2] C25B *1/02*
U.S. Cl. 204—129 **10 Claims**

1. A process for manufacturing hydrogen which comprises:
(a) passing an aqueous electrolyte and elemental iron or cobalt particles to an electrolytic cell comprising a cathode and a magnetic anode, said anode adapted to attract and retain said iron or cobalt particles;
(b) anodically oxidizing at least a portion of said iron or cobalt particles to non-ferromagnetic iron or cobalt con-

taining species with the generation of hydrogen at said cathode;

(c) passing said hydrogen and said oxidized, non-ferromagnetic iron or cobalt containing species from said cell;



(d) reducing at least a portion of said oxidized, non-ferromagnetic iron or cobalt containing species to elemental iron or cobalt by contacting the same with a carbonaceous reducing agent at elevated temperatures; and

(e) recycling at least a portion of the elemental iron or cobalt from step (d) to step (a).

4,202,745

METHOD FOR TREATING A DESIZING WASTE STREAM

Jurgen H. Exner, and Cyril B. Henke, both of Knoxville, Tenn., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jul. 7, 1978, Ser. No. 922,925

Int. Cl.[2] C02B *1/20*; C02C *5/02*

U.S. Cl. 204—180 R **5 Claims**

1. A method for treating an aqueous desizing waste stream containing dispersed polyvinyl alcohol which consists essentially of combining said stream with an aqueous nonoxidizing salt solution wherein the salt is Na_2SO_4, K_2SO_4, $(NH_4)_2SO_4$, Na_2CO_3, or K_2CO_3 under conditions of high shear mixing to an average salt concentration of about 7–14 percent by weight and a final salt concentration of at least about 4 percent at ambient temperature to about 80° C. to precipitate the major portion of the polyvinyl alcohol as a material containing less than twenty percent by weight of agglomerated salt and separating said precipitated polyvinyl alcohol from the mixture.

2. The process of claim 1 wherein the treated stream is subjected to electrodialysis after separation of the precipitated polymeric size, thereby producing a brine low in organic impurities and enriched in salt content and a solution low in salt content and high in organic impurities.

4,202,746

PREPARATION OF WATER-DILUTABLE POLYMERIC COMPOSITIONS AND CATHODIC COATING OF METALLIC SUBSTRATES

Cedric Lee, Harlow, and Martin E. Burrage, Bishops Stortford, both of England, assignors to Polymer Investments N.V., Curacao, Netherlands Antilles

Filed Jun. 26, 1978, Ser. No. 919,101

Claims priority, application United Kingdom, Jun. 27, 1977, 26849/77

Int. Cl.[2] C25D *13/06*

U.S. Cl. 204—181 C **7 Claims**

1. A process for applying a protective coating of a polymeric material to a metal substrate, comprising the steps of connecting the substrate as a cathode while immersed in a bath of an aqueous polymeric composition, connecting an anode as a counter-electrode in said bath, passing electric current between said anode and cathode thereby to electrodeposit polymeric material on said substrate,

said polymeric composition comprising a water-dilutable composition obtained by the steps of partially epoxidising a liquid polydiene selected from the group consisting of homopolymers of a 1,4-conjugated diene and copolymers comprising a major proportion by weight of a 1,4-conjugated diene and a minor proportion of monomer copolymerisable therewith, the liquid polydiene having a molecular weight such that the cathodically deposited layer of polymeric material will not substantially tend to run off a vertical surface, aminating the epoxidised polydiene at a temperature of at least 120° C. with at least one polyamine reactant to provide an ungelled liquid aminated epoxidised polymer containing at least one milliequivalent of combined amine groups per gram of said liquid aminated polymer, and thereafter at least partially neutralising the aminated polymeric material with acid to yield a water-dilutable material containing residual unsaturation in the polymer chain, and subjecting the electrodeposited polymeric material to oxidative cross-linking by reaction of residual unsaturation in the polymer chain with atmospheric oxygen at elevated temperature.

4,202,747

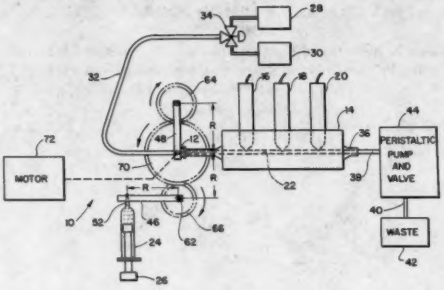
FLOW CELL FLUID AND SAMPLE SUPPLY MECHANISM

Edmund E. Buzza, Fullerton, and Richard C. Meyer, La Habra, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Jul. 6, 1978, Ser. No. 922,458

Int. Cl.[2] G01N *27/46*

U.S. Cl. 204—195 R **6 Claims**



1. In a flow cell for sample analysis including a passage therein for accommodating sample flow therethrough past sample measuring apparatus, the flow cell passage having a fluid entrance port, an improved fluid and sample supply mechanism comprising:

sample supply means having an outlet through which sample is delivered;

a first delivery mechanism supporting said sample supply means for presenting the outlet thereof to the fluid entrance port of said flow cell passage;

means for rotating said first delivery mechanism about an axis of rotation generally perpendicular to the direction of flow through said fluid entrance port to move said outlet in an arcuate path toward and away from said fluid entrance port;

fluid supply means including an outlet through which fluid is delivered;

a second delivery mechanism supporting said fluid delivery means for presenting the outlet thereof to the fluid entrance port ofsaid flow cell passage;

means for rotating said second delivery mechanism about an axis of rotation generally perpendicular to the direction of flow through said fluid entrance port to move the fluid delivery outlet in an arcuate path toward and away from said fluid entrance port; and

means for controlling the rotation of said first and second delivery mechanisms to selectively position the outlet of said sample supply means or the outlet of said fluid supply means at the fluid entrance port of the flow cell passage

for delivering sample or fluid, as required, through said fluid entrance port into the flow cell passage.

4,202,748

ELECTROCHEMICAL MEASURING CELL

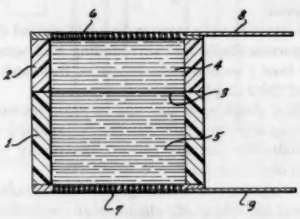
Armin Kroneisen, Frankfurt, Fed. Rep. of Germany, assignor to Hartmann & Braun AG., Frankfurt, Fed. Rep. of Germany

Filed Jul. 26, 1978, Ser. No. 928,058

Claims priority, application Fed. Rep. of Germany, Jul. 27, 1977, 2733781

Int. Cl.[2] G01N *27/46*

U.S. Cl. 204—195 R **12 Claims**



1. An electrochemical measuring cell for measuring the content of a particular component in a fluid, comprising:

container means;

an electrolyte in the container means distinct from the fluid;

a pair of electrodes made of similar metal and disposed on the container means to be in contact with the electrolyte therein, said electrodes being of perforated construction to permit said fluid to contact the electrolyte adjacent to the electrodes;

an additive in the electrolyte selected for reacting only with the particular component and being disposed in the vicinity of only one of the electrodes; and

barrier means disposed in the container separated from each electrode but in contact on each side with said electrolyte which separates the barrier means from the fluid external to the cell, for preventing the migration of the additive and of reaction products thereof with the particular component to the other one of the electrodes of the pair.

4,202,749

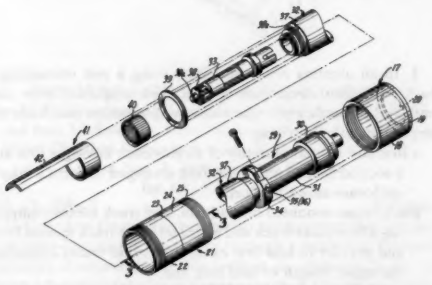
PROBE SYSTEM FOR DETERMINING ACIDITY OF FLUID FLOWING THROUGH PRESSURIZED PIPE LINE

Thomas C. Phelps, Gaston, and Clifford J. Reese, Roanoke Rapids, both of N.C., assignors to Champion International Corporation, Stamford, Conn.

Filed Apr. 19, 1979, Ser. No. 31,392

Int. Cl.[2] G01N *27/36*

U.S. Cl. 204—195 G **13 Claims**



1. A pH probe system having a pH probe adapted to be removably installed in-line within a pressurized pipe line to determine the acidity of fluid flowing through the pipe line, said system including:

(a) a mounting means secured to the external wall of said pipe line to mount said probe;

(b) a valve means in said mounting means to prevent fluid flow from said pipe line after said probe is removed from said pipe line;

(c) a cap means removably secured to said mounting means and having an opening therethrough;

(d) an elongated pH probe including a transducer which converts the acidity of the fluid in contact with the probe to an electrical signal representative of said acidity;

(e) a plastic resin coating on said pH probe adherent thereto and establishing an elongated sheath having a uniform external shape and size along its length; and

(f) sealing means within said cap means to seal against said sheath and to prevent fluid from flowing past said cap means, said sealing means permitting movement of said sheath relative to said cap means upon installation and removal of said probe within said pipe line.

4,202,750

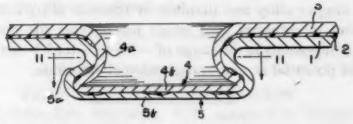
CONTAINER ANODE

Nick S. Khoury, Worth, Ill., assignor to The Continental Group, Inc., New York, N.Y.

Filed Feb. 22, 1977, Ser. No. 770,724

Int. Cl.[2] C23F *13/00*

U.S. Cl. 204—197 **8 Claims**



1. An article of manufacture comprising a container for a product likely to be deteriorated due to galvanic action, said container having a ferrous alloy wall with an inner surface having a protective coating thereon, an area on said wall having fractures in said coating, a sacrificial anode of sheet metal attached to said inner surface of said container wall at said fractured area, both said container wall and said anode being imperforate, said container wall and said anode each being formed with at least one protrusion, said anode having a portion circumjacent to said protrusion positioned in close opposition to said coating on said container wall and said protrusions having interlockingly nested leak tight overlapped portions formed in situ, said overlapped portion of said anode extending through said fractures and establishing electrical conductivity contacts through the fractures in said coating and said contacts being isolated from the interior of the container wall to prevent exposure of the underlying ferrous alloy to the product.

7. A method of attaching a sacrificial anode of sheet material to a wall portion of a can or similar metal container having a protective coating of product-compatible material on the inside surface thereof, comprising the steps of:

providing an anode of sheet material, pre-fracturing said coating in a predetermined area by impacting against the coating to form fractures thereby exposing the metal therebeneath, forming at least one protrusion in each of said wall portions and said anode in said fractured area of the coating while nesting the protrusions of said anode and said wall portion and

reforming aid nested protrusions to form interlocked rivets and expanding the anode rivet through the fractures and thereby establishing electrical conductivity therebetween and

said anode being dimensioned and positioned to completely shield the region of electrical conductivity from direct contact with product adapted to be placed within the can.

4,202,751

SACRIFICIAL ANODE AND APPARATUS EMPLOYING SAME FOR TREATING HOT SEA WATER

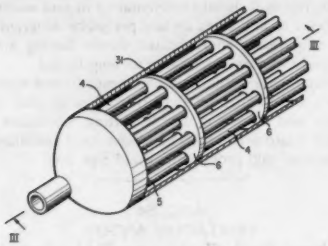
Toshio Fukuzuka; Kazutoshi Shimogori, both of Kobe; Hiroshi Satoh, Suita; Fumio Kamikubo, and Tatsuo Hara, both of Kobe, all of Japan, assignors to Kobe Steel, Ltd., Kobe, Japan

Filed May 15, 1978, Ser. No. 905,940

Claims priority, application Japan, Nov. 28, 1977, 52-143128

Int. Cl.[2] C23F *13/00*

U.S. Cl. 204—197 **5 Claims**



1. In an apparatus for treating hot sea water which contains components made of copper alloy and titanium or titanium alloys, the improvement comprising: a sacrificial anode provided in said apparatus in a position which contacts sea water, in a manner which establishes an electrical shortcircuit with said copper alloy and titanium or titanium alloy components serving as cathodes, said anode maintaining the potential of said components in the range of −0.5 to −0.65 V with respect to the potential at a saturated calomel electrode.

4,202,752

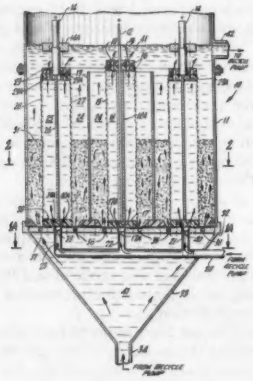
CELL WITH MULTIPLE ANODE-CATHODE CHAMBERS FOR FLUID BED ELECTROLYSIS

William G. Sherwood, Golden; Donald R. Hodges, Denver, both of Colo., and Cvetko Nikolic, Harvey, La., assignors to Amax Inc., Greenwich, Conn.

Continuation-in-part of Ser. No. 12,177, Feb. 16, 1979, and Ser. No. 12,178, Feb. 16, 1979. This application Apr. 3, 1979, Ser. No. 26,493

Int. Cl.[2] C25D *17/00, 21/04, 21/12, 21/16*

U.S. Cl. 204—222 **14 Claims**



1. A fluid bed electrolysis cell with multiple anode-cathode chambers which comprises,

a first anode disposed axially in said electrolysis cell within an anode chamber surrounded by a first porous diaphragm,

a first cathode surrounding said anode chamber,

said cathode being spaced such that an annular cathode chamber is provided adjacent and surrounding said anode chamber and adapted to support a fluidizable cathode bed of electrically conductive particulate material,

a second porous diaphragm spaced from and surrounding said first cathode,

said second diaphragm defining an annular chamber surrounding said first cathode adapted to support a fluidizable cathode bed of electrically conductive particulate material,

at least a second anode surrounding said second diaphragm,

a third porous diaphragm surrounding said second anode and at least a second cathode spaced from and surrounding said third diaphragm,

said third diaphragm and said at least second cathode defining a second cathode chamber adapted to support a fluidizable cathode bed of electrically conductive particulate material,

means for continuously feeding into said annular cathode chambers and said anode chambers an electrolyte containing at least one electroplatable metal ion,

the feed rate of said electrolyte being such as to maintain said bed of particulate material in said cathode chambers in an electro-chemically active fluidized state,

and cell exit means for said electrolyte.

4,202,753

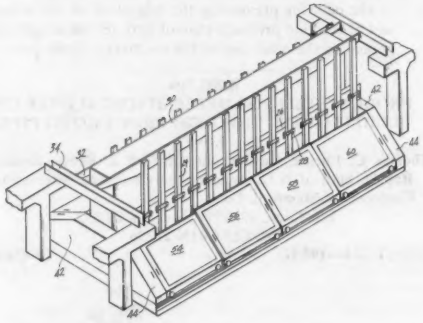
REDUCTION CELL HOOD

Donald R. Bradford, and James E. White, both of Lake Charles, La., assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Apr. 23, 1979, Ser. No. 32,032

Int. Cl.[2] C25C *3/22*

U.S. Cl. 204—247 **6 Claims**



1. In an alumina reduction cell having a pan containing a bath of molten electrolyte, a steel skirt supported over said bath and a plurality of carbon anodes disposed in said bath, the improvement comprising:

a first and second plurality of shields each having a first and a second spaced apart end face arranged to form a lateral enclosure along said cell;

track means mounted on said pan, said track means comprising a first outer track and a second inner track spaced from and parallel to said first outer track, said tracks extending the entire length of said cell; and

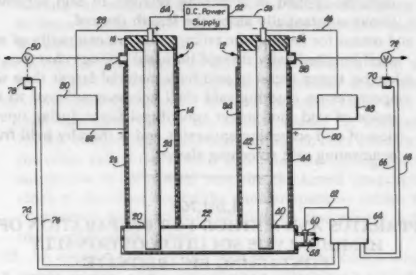
wherein said shields are slidably mounted on said cell and include a flexible gasket secured thereto for sealing the gap between said shields and said track means.

4,202,754

COMBINATION ELECTROLYTIC AND ELECTROSTATIC TREATER

Arthur S. King, 8021 Cherokee La., Leawood, Kans. 66206

Filed Dec. 26, 1978, Ser. No. 972,676
Int. Cl.[2] C25B 9/00
U.S. Cl. 204—272 4 Claims



1. A combination electrostatic and electrolytic treater for use in treating an electrolyte, said treater comprising:

a pair of separate chambers;

a pair of oppositely charged electrodes associated with each of said chambers respectively;

means electrically insulating one electrode of each chamber from the other electrode of the same chamber so that, as between electrodes of the same chamber, there can be no electrical current flow when an electrolyte is present therebetween; and

means for electrically connecting electrolyte in one of said chambers with electrolyte in the other,

the other electrode of each chamber being bare for direct physical contact with electrolyte contained within the corresponding chamber and said other electrodes being charged electrically oppositely of one another whereby to establish an electrical current flow between said other electrodes via said connecting means when electrolyte is present and to encourage coagulation and flocculation of hydrated solids within the electrolyte.

4,202,755

CATALYTIC METHOD FOR MAKING PITCH

Gerald H. Spiegelman, Wayne; Harry B. Nickles, Glen Rock, and Jack M. Solomon, West Caldwell, all of N.J., assignors to Witco Chemical Corp., New York, N.Y.

Filed Nov. 3, 1978, Ser. No. 957,762
Int. Cl.[2] C10C 3/04
U.S. Cl. 208—5 6 Claims

1. A method for making petroleum pitch comprising passing an oxygen containing gas source through a petroleum bottoms feedstock containing metallic sodium in amounts of 0.5 to about 5.0 weight percent at a temperature in the range of 650° to 750° F. for from about 5 to 100 minutes to obtain a pitch having a specific gravity of up to about 1.35 25/25.

4,202,756

PROCESS FOR THE PRODUCTION OF SOLVENT-REFINED COAL USEFUL AS STARTING MATERIAL FOR OTHER CARBONACEOUS PRODUCTS

Hisashi Murakami, Tokyo; Toshikatsu Ohtsubo, Kamishirakawa; Kenji Fukuda, Yamashita, and Noriaki Ohnishi, Ogawa, all of Japan, assignors to Mitsui Mining Co., Ltd. and Mitsui Coke Co., Ltd., both of Tokyo, Japan

Filed Jan. 9, 1978, Ser. No. 867,751
Claims priority, application Japan, Jan. 14, 1977, 52/2499; Jan. 14, 1977, 52/2500; Jan. 14, 1977, 52/2501
Int. Cl.[2] C10G 1/04
U.S. Cl. 208—8 LE 15 Claims

1. Process for the production of solid solvent-refined coal useful as a starting material for carbonaceous products selected from the group consisting of micromosaic carbonaceous products, coarse mosaic carbonaceous products and needle like carbonaceous products which process comprises: dissolving in a hydrocarbon solvent a starting coal selected from the group consisting of coals intrinsically having an oxygen/carbon atomic ratio (O/C) of 0.030 to <0.055 and coals pre-treated with a solvent, under hydrogen pressure, so as to have said O/C atomic ratio of 0.030 to <0.055; heating the resultant coal solution at a temperature of 380°–450° C. in the presence of a hydrogen pressure of at least 10 kg/cm^{2}G for a period of time sufficient to produce a solvent-refined coal selected from one having an O/C atomic ratio of 0.040 to <0.046, one having an O/C atomic ratio of 0.030 to <0.040 and one having an O/C atomic ratio of less than 0.030 removing undissolved matter from the resulting reaction mixture and removing said solvent to recover the solvent-refined coal.

4,202,757

COAL LIQUIFICATION PROCESS

Steven C. Amendola, Scarsdale, N.Y., assignor to Future Research, Inc., Yonkers, N.Y.

Filed Jul. 14, 1978, Ser. No. 924,799
Int. Cl.[2] C10G 1/06, 13/02; C10J 3/00
U.S. Cl. 208—10 21 Claims

1. A process for rapidly converting essentially solid carbonaceous material to essentially liquid and gaseous hydrocarbon products, comprising a first phase of reacting said solid material with at least one acid to form carbon addition products, and a second phase of reacting products of the first-phase reaction with a Lewis acid, halide-ion-acceptor (super-acid) system and hydrogen donor source (hydrogenation), and wherein the acid or acid combinations used in the first phase is capable of donating a negative ligand to the Lewis acid in the second phase in order to form carbonium ions.

4,202,758

HYDROPROCESSING OF HYDROCARBONS

Mark J. O'Hara, Mt. Prospect; Russell W. Johnson, Hoffman Estates, and Lee Hilfman, Mt. Prospect, all of Ill., assignors to UOP Inc., Des Plaines, Ill.

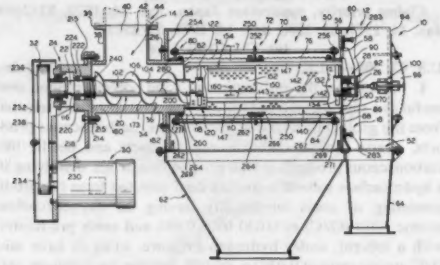
Continuation-in-part of Ser. No. 838,435, Sep. 30, 1977, Pat. No. 4,141,860. This application Dec. 26, 1978, Ser. No. 973,304
The portion of the term of this patent subsequent to Dec. 18, 1996, has been disclaimed.
Int. Cl.[2] C10G 23/02
U.S. Cl. 208—143 15 Claims

1. A hydrocarbon hyroprocess which comprises reacting a hydrocarbon with hydrogen at conditions selected to effect chemical consumption of hydrogen, and in contact with a catalytic composite comprising an alumina-zeolite support, a rare earth exchange metal component, at least one metal component from Group VIB or Group VIII and from about 0.1 to about 5 weight percent of at least one component from Group IIA based on the weight of the finished catalyst.

4,202,759
CENTRIFUGAL SCREENING APPARATUS

Otto C. Krolopp, Downers Grove, and Leonard M. Haluch, Chicago, both of Ill., assignors to Prater Industries, Inc., Chicago, Ill.

Filed Nov. 24, 1978, Ser. No. 963,402
Int. Cl.[2] B07B 9/00
U.S. Cl. 209—234 8 Claims

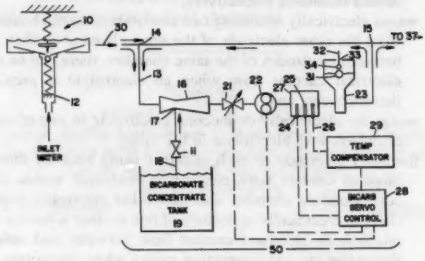


1. A centrifugal screening apparatus comprising:
a housing defining a tubular bulk materials in-feed chamber and a screening chamber in open side-by-side communication,
with said screening chamber being at one end of said in-feed chamber and defining a gravity discharge outlet therefrom,
an auger assembly received in said chambers,
a screening sleeve mounted in said screening chamber through which said auger assembly extends,
said screening sleeve comprising foraminous material through which the bulk materials are to be screened,
said auger assembly comprising:
an auger extending through said in-feed chamber and being journaled at one end thereof at the other end of said in-feed chamber,
said auger at its other end extending into said screening chamber,
a combination metal trap and bulk material feed distributor disposed within said screening sleeve and comprising:
a cylindrical shell extending the effective length of said screening sleeve and having an internal diameter that exceeds that of said auger and an outer diameter whereby the outer surfacing of said shell is in closely spaced relation to but spaced from said screening sleeve,
said shell defining lengthwise thereof uniformly spaced apertures thereabout separated by imperforate walling,
said shell at one end thereof extending over said other end of said auger,
first spider means disposed interiorly of said shell for making said shell one end fast to said auger other end in coaxial concentric relation thereto,
a stub shaft disposed adjacent the other end of said shell,
second spider means disposed interiorly of said shell for making said shell other end fast to said stub shaft in coaxial concentric relation thereto,
said housing further defining in alignment with said screening sleeve a tailings receiving chamber,
third spider means for journaling said stub shaft in coaxial alignment with said auger and disposed exteriorly of said shell other end,
said shell other end being open to said tailings chamber,
means for making said screening chamber closed to said tailings receiving chamber exteriorly of said screening sleeve,
said first spider means being open for unrestricted movement therethrough of the bulk materials from the auger into said shell,
said second and third spider means being open for unrestricted movement therethrough of tailings from said shell into said tailings chamber,
means for rotating said auger assembly at a speed that is at least 200 rpm,
said shell apertures being proportioned in size for effecting bulk material passage radially of said shell under the centrifugal force generated by said auger assembly along substantially the length of said shell for spreading the bulk material applied in screening relation to said screening sleeve substantially along the length thereof,
and means for feeding the tailings that are externally of said shell longitudinally thereof into said tailings chamber,
whereby tramp metal in said bulk material larger than said apertures on entering said shell becomes adhered to the inside of said shell under centrifugal force during operation of said screening apparatus and is thereby held from penetrating said screening sleeve.

4,202,760
APPARATUS AND METHOD FOR PREPARATION OF A HEMODIALYSIS SOLUTION OPTIONALLY CONTAINING BICARBONATE

L. Robert Storey, Hollywood, Fla., and Robert C. Hall, Pleasant Hill, Calif., assignors to Cordis Dow Corp., Miami, Fla.

Filed Jul. 24, 1978, Ser. No. 927,322
Int. Cl.[2] B01D 13/00, 31/00
U.S. Cl. 210—22 A 18 Claims



1. Apparatus for preparing dialysate for use in hemodialysis which comprises a main line connected at its inlet end to a water source and at its exit end to an artificial kidney, a dialysate recirculation line connected into said main line at an upstream end and at a spaced downstream end, and including dialysate venturi means connected at its ends into said recirculation line and at its throat portion with a line to a dialysate concentrate tank, conductivity measuring means in said recirculation line adjacent to and downstream of said venturi means, and pump means in said recirculation line downstream of said conductivity measuring means.

4,202,761
SORTING APPARATUS FOR SORTING FIBER SUSPENSIONS

Emil Holz, Eningen, Fed. Rep. of Germany, assignor to Hermann Finckh Maschinenfabrik, Fed. Rep. of Germany

Filed Mar. 16, 1978, Ser. No. 887,223
Claims priority, application Fed. Rep. of Germany, Mar. 23, 1977, 2712749
Int. Cl.[2] B04C 9/00
U.S. Cl. 209—17 19 Claims

1. An apparatus for sorting fiber suspensions comprising:
a stationary cylindrical screen cage;
a rotor having a cylindrical wall mounted concentrically relative to the screen cage, the screen cage and said rotor forming an annular space therebetween;
an inlet for fiber suspension to be sorted, the inlet being in flow communication with one end of said annular space to

introduce at least a first portion of the fibrous suspension to be sorted into said one end of the annular space, the fibrous suspension within the annular space flowing generally toward the other end of said annular space, a portion of the suspension within the annular space passing through the screen cage as accepted stock, the suspension within the annular space and that passing from said other end thereof being unaccepted stock, the action of the rotor causing the unaccepted stock within the annular space to increase in consistency as it flows toward said other end of the annular space;

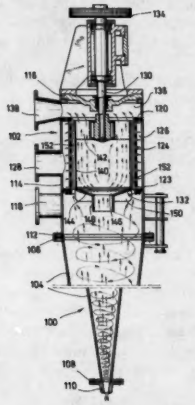
an accepted stock outlet in flow communication with the side of said screen cage opposite the annular space; and

an unaccepted stock outlet in flow communication with at least said other end of the annular space, the apparatus further comprising means connecting the inlet directly to the other end of the annular space for introducing fibrous suspension to be sorted into the thickened unaccepted stock at the other end of the annular space to reduce the consistency of the latter to facilitate its conveyance to the unaccepted stock outlet.

19. An apparatus for sorting fiber suspensions comprising:

a vortex cleaner, said vortex cleaner generating a vertically upward flow of fibrous suspension to be sorted;

a stationary cylindrical screen cage mounted concentric with and at the upper end of the vortex cleaner;



a rotor having a vertically oriented axis and a cylindrical wall mounted concentrically relative to the screen cage, the screen cage and said rotor forming an annular space therebetween, the rotor further comprising a base at its lower end, portions of the rotor forming an opening through the base of the rotor in flow communication with the upper end of the annular space, the opening being substantially coaxial with the flow of suspension from the vortex cleaner, fibrous suspension to be sorted flowing upwardly from the vortex cleaner into the lower end of the annular space, the fibrous suspension within the annular space flowing generally toward the upper of said annular space, a portion of the suspension within the annular space passing through the screen cage as accepted stock, the suspension within the annular space and that passing from said other end thereof being unaccepted stock, the action of the rotor causing the unaccepted stock within the annular space to increase in consistency as it flows toward said other end of the annular space, fibrous suspension to be sorted passing through the opening to the other end of the annular space for the dilution of the unaccepted stock;

an accepted stock outlet in flow communication with the side of said screen cage opposite the annular space; and

an unaccepted stock outlet in flow communication with at least said upper end of the annular space.

4,202,762

PROCESS AND DEVICE FOR THE AERATION OF WASTE WATER

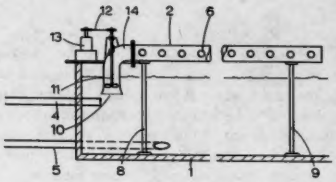
Freerk J. Fontein, Heerlen, and Hubertus F. Jennekens, Geleen, both of Netherlands, assignors to Stamicarbon, B.V., Geleen, Netherlands

Continuation of Ser. No. 794,023, May 5, 1977, abandoned, which is a continuation-in-part of Ser. No. 437,477, Jan. 28, 1974, abandoned. This application Dec. 15, 1978, Ser. No. 969,963

Claims priority, application Netherlands, Jan. 29, 1973, 01201/73

Int. Cl.[2] **C02C** *1/10*

U.S. Cl. 210—3 **15 Claims**



1. A process for aerating waste water containing suspended biologically active sludge in a vessel comprising:

(a) circulating waste water within the vessel through one continuous substantially horizontal endless path so that the active sludge remains in suspension and is thoroughly mixed throughout the vessel;

(b) withdrawing waste water from the vessel and recirculating that withdrawn water back to the vessel in the form of a number of regularly divided, downwardly inclined waterjets located above the surface of the waste water along one or more located above the surface of the waste water along one or more radii of the vessel so that all the waterjets are directed in the circulation direction, using at least one discharge tube located above the surface of the water in the vessel and having a plurality of outlet openings spaced from one another so as to extend along the length of the discharge tube, and wherein the step of recirculating waste water includes passing the withdrawn waste water through said at least one discharge tube;

(c) controlling the velocity and positioning of the waterjets so that the velocity of the waterjets ranges between about 3 to about 12 meters per second and the angle of the jets is not greater than 60°,

whereby the stream emitted in the form of waterjets has a horizontal component at the point the stream strikes the waste water that is substantially parallel to the circulation direction within the vessel thereby minimizing the energy imparted to the waterjets, entraining air within the waste water in the vessel and maintaining the substantially horizontal circulation in the vessel;

(d) employing a sludge suspension factor of at least 0.10 determined according to the following equation:

$$F = K\sqrt{A} \cdot 1000/I \cdot (Q \times V \times \cos \alpha)$$

where:

F = sludge suspension factor

I = surface area of the vessel (m^2)

A = number of waterjets

Q = average amount of liquid per jet (m^3/s)

V = velocity of liquid in jet (m/s)

α = angle between jet and surface at the point where they meet

K = constant factor, dependent on the shape of the basin.

4,202,763

HIGH-EFFICIENT ACTIVATED SLUDGE METHOD

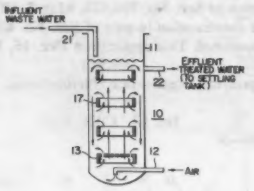
Norio Shimizu, and Youji Odawara, both of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Feb. 4, 1976, Ser. No. 655,218

Claims priority, application Japan, Feb. 7, 1975, 50-15398; Jun. 20, 1975, 50-74432

Int. Cl.[2] C02C *1/06*

U.S. Cl. 210—14 14 Claims



1. A method for high-efficient microbiological oxidation treatment of waste water containing organic materials, wherein the waste water is introduced into an aeration tank and is subjected to aeration treatment in the presence of activated sludge while supplying oxygen to the tank, which comprises forming flocs consisting mainly of bacteria and oxidizing the organic materials at an oxygen transfer rate of 10 to 80 mmol O_2/l-hr to the aeration tank and separating said flocs from said waste after the oxidation of said organic material.

4,202,764

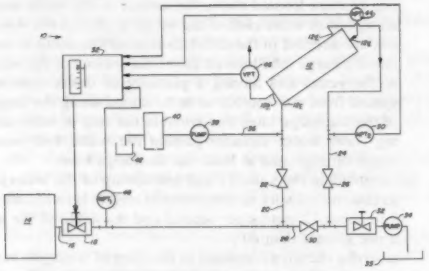
ULTRAFILTRATION CONTROL SYSTEM

Richard L. Afflerbaugh, and Wendell V. Ebling, both of Libertyville, Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Oct. 2, 1978, Ser. No. 947,993

Int. Cl.[2] B01D *13/00*

U.S. Cl. 210—22 D 14 Claims



1. A dialysis machine that is adapted for operation with a negative pressure-type dialyzer which has a semipermeable membrane that separates dialysis solution and blood flowing through said dialyzer, said machine including:

(a) a flow system which includes negative pressure pump means for drawing fresh dialysis solution under a negative pressure from a source through said dialyzer and for discharging the spent dialysis solution to a drain;

wherein the improvement comprises, in combination:

(b) valve means positioned in said flow system for isolating said dialyzer from said negative pressure pump means, and for terminating flow of dialysis solution to and from said dialyzer;

(c) means defining an ultrafiltration branch connected to the flow system between the dialyzer and the valve means for communication with said dialyzer when said dialyzer is isolated and flow is terminated and for drawing liquid from said dialyzer, said ultrafiltration branch including:

(i) ultrafiltration pump means for drawing and controlling the flow of liquid from the dialyzer so as to adjustably establish an ultrafiltration rate;

(ii) means for measuring the liquid flow rates in said branch; and

(d) means associated with said branch and said dialyzer for measuring the pressure on the blood and dialysis solution sides of the dialyzer at the time the desired ultrafiltration rate is established and for determining a transmembrane pressure.

4,202,765

HYDROXYLAMINE PURIFICATION VIA CATION EXCHANGE

Fred W. Koff, Long Valley; Allen A. Tunick, Boonton; Stylianos Sifniades, Madison, and Reed H. Belden, Bernardsville, all of N.J., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 846,660, Oct. 28, 1977, abandoned. This application Oct. 4, 1978, Ser. No. 947,321

Int. Cl.[2] B01D *15/04*

U.S. Cl. 210—31 R 16 Claims

15. A cyclic process for separating hydroxylamine, under conditions suitable for ion exchange of hydroxyl ammonium ion, from aqueous solutions having a pH not above about 7 containing essentially hydroxylammonium sulfate and nitrate, ammonium sulfate and nitrate, and sulfuric acid comprising the following steps:

(a) passing said solutions through a sulfonic acid resin bed loaded predominantly with ammonium ions;

(b) passing through said resin bed an aqueous solution containing essentially ammonia and hydroxylamine;

(c) passing through said resin bed water and regenerating said resin bed to provide the bed for step (a) of the next cycle;

(d) concurrently with steps (a), (b) and (c) collecting a first effluent fraction substantially depleted of hydroxylammonium ion and correspondingly enriched in ammonium ion and a second effluent fraction containing essentially pure hydroxylamine;

(e) mixing part of said second effluent fraction with ammonia or an ammonia containing aqueous solution and recycling the resulting solution to step (b) of the next cycle.

4,202,766

PROCESS FOR REMOVING OIL PARTICLES FROM WASTE WATER CONTAINING THE SAME

Hiroshi Ono, No. 21-1, Asahi-cho, Fujisawa-shi, Kanagawa-ken; Toyoyasu Saida, No. 14-15, Kataseyama 3-chome, Fujisawa-shi, Kanagawa-ken, and Kunimitsu Fukumura, No. 2070, Iijima-cho, Totsuka-ku, Yokohama-shi, Kanagawa-ken, all of Japan

Continuation of Ser. No. 761,131, Jan. 21, 1977, abandoned, which is a continuation-in-part of Ser. No. 579,319, May 21, 1975, abandoned. This application Jun. 22, 1978, Ser. No. 917,844

Claims priority, application Japan, May 27, 1974, 49-58747; Sep. 27, 1974, 49-110440

Int. Cl.[2] C02C *5/02*

U.S. Cl. 210—40 2 Claims

1. A process for the separation of oil from waste water containing the said oil in the form of anionically emulsified and stabilized particles, which consists of introducing into said waste water a solid compound selected solely from the group consisting of calcium oxide and calcium hydroxide to adsorb thereon said oil, said solid compound being introduced in an amount of 5 to 200% by weight of said oil contained in said waste water; adding an acid selected from the group consisting of hydrochloric acid and nitric acid to said waste water to dissolve said compound, whereby the oil is freed in the form of

large size particles, the pH of said waste water being in the range of 6 to 7 after the acid has been added; and separating said freed oil from said waste water.

4,202,767

PROCESS AND DEVICE FOR THE PURIFICATION OF WASTE WATER BY MEANS OF ELECTROFLOTATION

Marinus Alfenaar, Schinnen, Netherlands, assignor to Stamicarbon, B.V., Geleen, Netherlands

Filed Jul. 28, 1976, Ser. No. 709,534

Claims priority, application Netherlands, Aug. 6, 1975, 7509342

Int. Cl.² B03D *1/00*

U.S. Cl. 210—44 **8 Claims**

1. In a process for removing emulsified or suspended substances from waste water by flotation technique in a flotation cell in which said emulsified or suspended substances separate as an upper layer on said waste water and then by removing said upper layer from said waste water, wherein said waste water is passed through a pair of operating electrodes, said electrodes being disposed horizontally and at some distance from each other, the improvement comprising forming said electrodes of perforated material, wherein the diameter of the apertures of the material forming the lower electrode is at most 5 millimeters thereby ensuring proper upward movement of gas bubbles which are generated, wherein said electrodes cause the generation of said gas bubbles which entrap said emulsified or suspended substances and cause the suspended or emulsified substances to flow upward to form a foam at the surface of the waste water.

8. A flotation cell comprising a vessel with an inlet for aqueous emulsions, dispersions or colloidal solutions, an outlet for treated water and an outlet for floated foam, provided with two electrodes, of perforated material, horizontally disposed with respect to each other, said electrodes equipped with terminals for applying a voltage, and disposed in said cell, the diameter of the apertures in the material of the lower electrode being at most 5 millimeters.

4,202,768

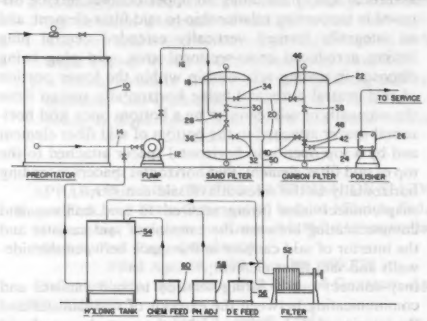
BACKWASH WATER RECYCLING SYSTEM

Harry C. De Longe, Katonah, and Woolfe S. Fabian, Flushing, both of N.Y., assignors to PepsiCo, Inc., Purchase, N.Y.

Filed Sep. 19, 1978, Ser. No. 943,806

Int. Cl.² B01D *23/24*

U.S. Cl. 210—62 **15 Claims**



1. A process for the treatment and recycling of an aqueous backwash effluent resulting from a backwashing operation, in which an industrial filter is cleaned by passing a water-based solution through the filter in countercurrent flow to that passing through the filter during normal filtering operation so that material entrapped by the filter during the normal filtering operation is dislodged therefrom and entrained in a backwash effluent, comprising the steps of:

(a) passing said backwash effluent through a backwash filter to remove the material initially removed from said industrial filter during the backwashing operation;

(b) preparing the water-based solution which has passed through said backwash filter for use in a subsequent backwashing operation; and

(c) utilizing in subsequent backwashing operations the water-based solution which has passed through said backwash filter.

10. Apparatus for treating and recycling an aqueous backwash effluent resulting from backwashing operations on an industrial filter, comprising:

(a) a holding tank for storing a water-based solution adapted for use in periodic backwashing operations;

(b) a backwash filter for removing material from the water-based effluent flowing from the industrial filter during each backwashing operation;

(c) first conduit means for conducting the water-based solution from said holding tank to the industrial filter for effecting each backwashing operation of said industrial filter;

(d) second conduit means for conducting the water-based effluent flowing from the industrial filter during each backwashing operation to said backwash filter; and

(e) third conduit means for conducting the water-based solution flowing from said backwash filter during each backwashing operation to said holding tank.

4,202,769

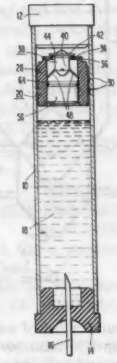
METHOD FOR SEPARATING SERUM OR PLASMA FROM THE FORMED ELEMENTS OF BLOOD

Donald J. Greenspan, 235 Pavilion Ave., Riverside, N.J. 08075

Continuation of Ser. No. 807,013, Jun. 16, 1977, abandoned. This application Nov. 24, 1978, Ser. No. 963,298

Int. Cl.² B01D *21/26*

U.S. Cl. 210—83 **8 Claims**



1. A method of separating blood into a light phase comprising plasma or serum and a heavy phase comprising the formed elements of the blood including a separator assembly comprising a container having one end and another end, said container being adapted to receive blood from subsequent separation into the light phase and the heavy phase, piston means having an average specific gravity greater than said light phase, the piston means including a container sealing means adapted to sealingly engage the container wall at the periphery of the container, a valve seating portion having a valve opening therein, said valve opening permitting serum or plasma to flow through the piston means, a movable valve member adapted to seat on the seating portion so as to close the valve opening, and

bias means connected between the valve member and the valve seating portion, said method comprising the following steps:

centrifuging the formed elements of the blood toward one end of the container so as to form the heavy phase and the plasma or serum toward the other end of the container so as to form the light phase;

centrifuging the piston means through the container toward the interface of the centrifuged formed elements and the centrifuged plasma or serum;

overcoming the seating force maintained by the bias means on the valve member during centrifuging so as to open the valve opening; and

maintaining a substantial seating force on the valve member through the bias means when the piston means comes to rest in the container so as to close the valve opening; said force being sufficiently great to maintain said valve member in a seated position when said valve member comes to rest in the container at the interface between said light phase and said heavy phase.

4,202,770

APPARATUS FOR PURIFICATION OF WASTE WATER BY MEANS OF ACTIVE CARBON

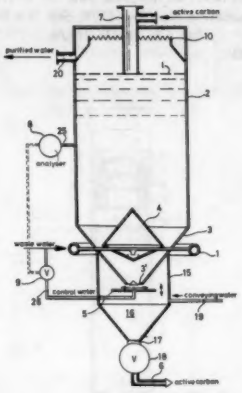
Günther Gappa, Gelsenkirchen-Buer; Harald Jüntgen, and Jürgen Klein, both of Essen, all of Fed. Rep. of Germany, assignors to Bergwerksverband GmbH, Essen, Fed. Rep. of Germany

Filed Aug. 5, 1975, Ser. No. 602,000

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1974, 2437745

Int. Cl.[2] B01D *33/18*

U.S. Cl. 210—96.1 **5 Claims**



1. Apparatus for the purification of waste water using active carbon, comprising an upright adsorber having an upper end and a frustoconical outlet end defining a lower outlet opening; inlet means for continuously feeding active carbon into said upper end of said adsorber so that the carbon forms a column filling said adsorber up to a level slightly below said upper end and leaves said adsorber through said outlet opening; a distributor cone arranged in the region of the upper third of said frustoconical outlet end, said distributor cone having an upwardly tapering conical wall and being provided therein with a plurality of apertures, the sum of the open cross-sections of said apertures being 0.1–1% of the transverse cross-section of the adsorber, said distributor cone being closed at its base and defines between the circumference of its base and the wall of said frustoconical outlet end an annular gap through which carbon passes to said outlet opening; feed conduit means for continuously feeding waste water into said distributor cone so that the waste water flows upwardly through said apertures and the carbon in the adsorber; an outlet for purified water in the region of said upper end of said adsorber above the level of the carbon therein; wall means connected to said frustoconical outlet end of said adsorber and defining a compartment below said outlet opening; a discharge disk in said compartment below said outlet opening and defining with the latter a vertical gap; a conduit branching off from said feed conduit means and having an outlet end in a central region of said disk for feeding part of the waste water into said vertical gap; a deflecting element facing said outlet end of said conduit and operative for transversely deflecting the part of the waste water fed into said vertical gap so as to thereby expedite passage of carbon through said outlet end; valve means in said branch conduit for relating the flow of waste water therethrough; and a discharge opening at the lower end of said compartment.

4,202,771

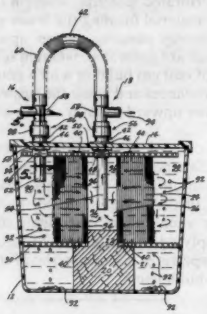
CHEMICAL RECOVERY FILTER

Robert W. Hoff, R.R. 2, Box 66, Hudson, S. Dak. 57034

Filed Dec. 29, 1978, Ser. No. 974,341

Int. Cl.[2] B01D *27/10*

U.S. Cl. 210—130 **2 Claims**



1. A chemical recovery filter, comprising:

a canister;

a steel wire filter element having a central core, said steel wire filter element being disposed within said canister; being vertically spaced from the bottom of said canister by a vertical spacer including an upper contact surface disposed in supporting relationship to said filter element; and an integrally formed vertically extended central plug having a reduced cross-sectional area, said plug being disposed in mating relationship within the lower portion of said central core; and being horizontally spaced from the sidewalls of said canister by a bottom open grid horizontal spacer attached to the bottom of said filter element and by a top open grid horizontal spacer attached to the top of said filter element, said horizontal spacers extending horizontally to the sidewalls of said canister;

a snap-connect inlet fitting secured to said canister and communicating between the exterior of said canister and the interior of said canister in the space between the sidewalls and said filter element;

a snap-connect outlet fitting secured to said canister and communicating between the exterior of said canister and the interior of said canister within the central core of said filter element;

said snap-connect fittings including a male snap connector stem attached to said canister, said male stem having an annular groove in the portion extending exterior of said canister; a female snap connector element including retainer tabs moveable between a first position wherein said tabs are disposed in mating relationship with said annular groove and a second position wherein said tabs are retracted and separated a distance greater than the diameter of said male stem, and a neoprene o-ring disposed above

said retainer tabs in sealing relationship with the upper portion of said male stem and the inside wall of the female connector; and a stainless steel spring contacting said tabs and biasing said tabs to said first position, whereby the female connector is rotatably attached to said male connector when said retainer tabs are in said first position; and

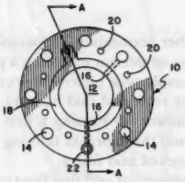
a by-pass tube connected to and communicating between said inlet fitting and said outlet fitting, said tube being disposed exterior of said canister and including an opening in the uppermost portion thereof.

4,202,772

FLUID DISTRIBUTION CELL MODULE

Arthur L. Goldstein, Weston, Mass., assignor to Ionics, Incorporated, Watertown, Mass.

Filed Aug. 4, 1977, Ser. No. 821,880
Int. Cl.² B01D *31/00*
U.S. Cl. 210—232 **21 Claims**



11. A multi purpose membrane processing stack for fluid treatment comprising in combination at least two substantially identical configurated cell modules in face to face relationship, each cell module comprising a rotatable plate having:

a. a central aperture transverse of said plate;

b. more than two fluid distribution ports transverse of said rotatable plate, said ports equally spaced apart in a symmetrical configuration about said aperture so that during assembly, rotation of said plate to any other port position with respect to an adjacent plate will allow said ports therein to remain registered and aligned with respect to the ports of said adjacent plate;

c. an enclosed second fluid connecting passage communicating between one of said ports and said aperture;

d. an enclosed second fluid connecting passage communicating between a second of said ports and said aperture; whereby said fluid connecting passages form an included angle (alpha) which is substantially less than 180°.

e. a planar recess in at least one face abutting said central aperture, said stack further including at least one membrane or diaphragm within one of said planar recesses.

4,202,773

APPARATUS FOR THE DEWATERING OF SLUDGE

Eugen Fink, and Peter Ostermeyer, both of Münich, Fed. Rep. of Germany, assignors to Krauss-Maffei Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Apr. 19, 1978, Ser. No. 897,724
Claims priority, application Fed. Rep. of Germany, Apr. 27, 1977, 2718673
Int. Cl.² B04B *3/04*
U.S. Cl. 210—256 **9 Claims**

1. An apparatus for dewatering sludge by subjecting a flowable material-containing sludge solids and liquid to separation in a first step into a solids-containing sludge phase and a liquid phase and the sludge phase is further dewatered to separate the same into solids and liquid, said apparatus comprising:

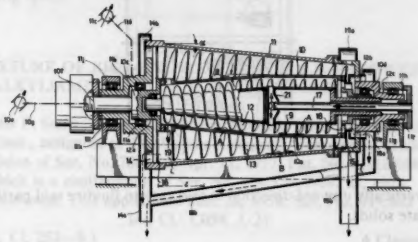
a first elongated imperforate drum rotatable about an axis for subjecting material on the interior of said drum to a first centrifugal force field;

means for rotating the first drum about said axis;

an inlet opening into said drum for distributing said flowable material onto the interior thereof;

first stripper means cooperating with said first drum for displacing the sludge phase formed by separation of liquid phase from said flowable material along said first drum away from said inlet toward a first sludge outlet at one end of said first drum, the other end of said first drum being provided with an outlet for said liquid phase;

a second elongated rotatable imperforate drum having a sludge inlet formed by the sludge outlet of said first drum for directly receiving the sludge phase therefrom, said second drum having a sludge outlet remote from said sludge inlet and a liquid outlet proximal to said sludge inlet, said drums being coaxial;



means for rotating said second drum to impart to the sludge phase therein a centrifugal-force field substantially twice the amplitude of the centrifugal-force field to which the material is subjected in said first drum whereby the sludge phase is subjected to the second centrifugal-force field of said second drum substantially out of contact over at least a major portion of the length of the drum with the liquid separated from the solids in said second drum, said second drum surrounding said first drum and having an average diameter substantially twice that of the first drum, said drums conically converging in opposite directions; and

second stripper means cooperating with said second drum for displacing solids separated from said sludge phase in the second centrifugal-force field from said sludge inlet toward said solids outlet.

4,202,774

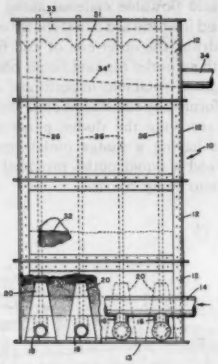
FLOW DISTRIBUTOR FOR FLUID BED BIOLOGICAL REACTOR

Peter Kos, Ridgefield, Conn., assignor to Dorr-Oliver Incorporated, Stamford, Conn.

Filed May 24, 1978, Ser. No. 909,076
Int. Cl.² B01D *23/18, 41/02*
U.S. Cl. 210—274 **17 Claims**

1. A liquid treatment apparatus including a tank, a quantity of inert particulate solids therein, an inlet adjacent the bottom of said tank for receiving liquid for treatment, a flow distributor located proximate the bottom of said tank to direct said liquid upwardly into said tank in a manner such that the particulate solids are fluidized without excessive turbulence, said flow distributor comprising a plurality of ports opening within said tank and communicating with said inlet, fluid portals within said tank, each of said fluid portals being in flow communication with one of said ports and constituting a walled divergent flow path of increasing cross-sectional area with increasing distance from its respective communicating port whereby the velocity of liquid traversing said fluid portals from said port is uniformly diminished, said fluid portals being oriented so that the liquid flowing therein is directed at an angle in the range from the horizontal to vertically downward in said tank, flow diffusers, having flow confining walls, each

in flow communication with a fluid portal at one end thereof and oriented to direct flow from said fluid portal in a generally



vertically upward direction in said tank to fluidize said particulate solids.

4,202,775

ADSORBENT FOR ADSORBING ORGANIC COMPOUNDS ADSORBED ON PROTEINS

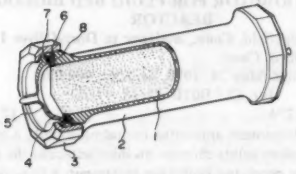
Tsutomu Abe, Fuji; Akihiko Ikeda, Yokohama, and Tokio Sakurai, Nobeoka, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jun. 22, 1978, Ser. No. 917,828

Claims priority, application Japan, Jun. 24, 1977, 52-74516; Jul. 5, 1977, 52-80338

Int. Cl.[2] B01D *15/04*

U.S. Cl. 210—287 **8 Claims**



1. An adsorbent for adsorbing thereonto organic compounds from plasma proteins in blood on which proteins the organic compounds are adsorbed, said adsorbent comprising a porous copolymer produced by copolymerizing a mixture of monomers consisting essentially of 2% to 99% by weight of at least one cross-linkable monomer and 1% to 98% by weight of at least one mono-ethylenically unsaturated monomer, said porous copolymer having pores of an average pore diameter (d) in the range of from 600 Å to 5,000 Å, the volume of pores of a pore diameter in the range of from 0.5 d to 2 d being not more than 60% of the total volume in said porous copolymer.

4,202,776

HOLLOW-FIBER PERMEABILITY APPARATUS

Yasushi Joh, Yokohama, Japan, assignor to Nippon Zeon Co., Ltd., Tokyo, Japan

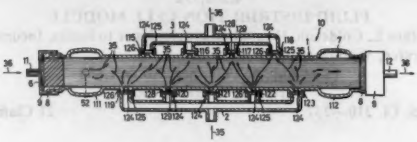
Division of Ser. No. 707,513, Jul. 22, 1976, Pat. No. 4,124,510. This application Jan. 27, 1978, Ser. No. 872,883

Claims priority, application Japan, Jul. 28, 1975, 50-91716; Jul. 30, 1976, 51-92902

The portion of the term of this patent subsequent to Nov. 7, 1995, has been disclaimed.

Int. Cl.[2] B01D *31/00*

U.S. Cl. 210—321 B **7 Claims**



1. In a hollow-fiber permeability apparatus, comprising:

a housing defining an interior including a permeating region;

a bundle of permeable-wall hollow fibers disposed at least in said permeating region of said housing;

a first inlet and means for causing a first fluid to flow into said first inlet and through said housing adjacent the exterior wall surfaces of said fibers;

a first outlet for passage of said first fluid out of said housing; and

a second inlet and means for causing a second fluid to flow into said second inlet and through said housing inside said fibers such that materials selectively permeate through the walls of said fibers;

the improvement wherein said housing is defined by opposed longer walls and interconnecting opposed shorter walls whereby the housing has a flattened cross-section in a plane perpendicular to the longitudinal extent of said fibers, said first inlet comprising one group of at least two openings formed in one longer wall and spaced-apart in the longitudinal direction of the fibers, said first outlet comprising another group of at least two openings formed in the opposite longer wall and spaced-apart in the longitudinal direction of said fibers, the openings comprising said first inlet providing for feeding of said first fluid in a plurality of independent streams across separate portions of said bundle into the openings comprising said first outlet, each of said openings extending across said longer walls whereby the openings are substantially coextensive with the longer transverse dimension of said bundle of fibers, and wherein each of said openings comprises a slit-like opening whereby said separate portions each comprise only a small longitudinal portion of the bundle for engagement by the first fluid exiting from the openings of said first inlet.

4,202,777

FLOW DISTRIBUTION MEANS FOR SCREENING APPARATUS

Robert A. Schall, Stamford, Conn., assignor to Dorr-Oliver Incorporated, Stamford, Conn.

Filed Jan. 2, 1979, Ser. No. 353

Int. Cl.[2] B01D *35/22*

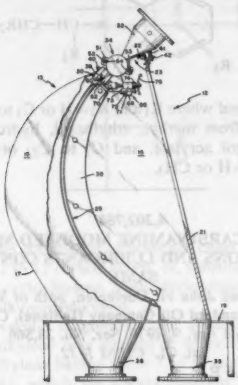
U.S. Cl. 210—405 **9 Claims**

1. A screen unit for separating solids from a liquid-solids slurry, comprising

(a) a screening surface having a plurality of discharge openings,

(b) spaced outlets for respectively receiving solids overflow from said screen surface and liquid underflow from said discharge openings,

(c) feed input means for receiving a liquid-solids slurry for discharge to said screen surface,
(d) nozzle means interposed between said feed input means and said screen surface for distributing and controlling the flow of said slurry to the surface of said screen,
(e) said nozzle means including a cylindrical housing mounted on said screen unit and extending transversely of said screen surface adjacent one end thereof and having a longitudinally extending discharge opening,



(f) valve means contained within said nozzle housing and including a tubular rotatable member having spaced inlet and outlet longitudinal slot openings aligned respectively with the discharge of said feed input means and with said discharge opening in said nozzle housing, and
(g) control means connected to said rotatable valve member for rotating said member to selectively vary the size of said pair of aligned openings and the velocity of flow of said liquid-solids slurry through said nozzle means to said screen surface.

4,202,778

SEPARATING DEVICE

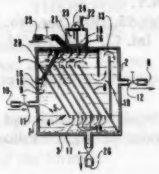
Cornelis G. Middelbeek, Nootdorp, Netherlands, assignor to Ballast-Nedam Groep N.V., Amstelveen and Skimovex B.V, Utrecht, both of, Netherlands

Filed Oct. 30, 1978, Ser. No. 955,629

Claims priority, application Netherlands, Oct. 31, 1977, 7711963

Int. Cl.[2] **B01D** *21/00*

U.S. Cl. 210—522 **5 Claims**



1. A separating device for separating by gravitational segregation a mixture of a carrier liquid and substances suspended therein and having a specific weight differing from that of the carrier liquid, said device comprising a separator housing having an inlet port and an outlet port, a separator arranged in said housing and having at least two parallel, sloping plates, the front plate nearest the inlet port for the mixture together with the front wall and the bottom of the housing enclosing a stilling space having on the top side a first collecting space intended for light-weight substances, a feeding space near the inlet side of the separator, a second collecting space near the top wall and a third collecting space enclosed by the rear wall and the hindmost plate nearest thereto and located near the outlet port for the carrier liquid, in which the stilling space, the separator and the third collecting space are disposed at substantially the same level, characterized in that the separator housing is constructed as a pressure vessel, the flow resistance between the stilling space and the feeding space is low and the first and second collecting spaces communicate with one another through at least one conduit in parallel with said separator, the flow resistance of which exceeds that of the separator, and including means for selectively discharging lighter substances from said second collecting space, means for selectively discharging heavier substances from said feeding space, and means for selectively discharging gases from said second collecting space.

4,202,779

MIXTURE OF BIS(2-HYDROXYALKYL) N,N-DI(LOWER ALKYL)AMINOMETHANEPHOSPHONATES WITH POLYOLS

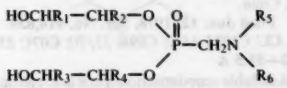
Curtis P. Smith, Cheshire, and Henri Ulrich, Northford, both of Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 786,690, Apr. 11, 1977, Pat. No. 4,112,014, which is a continuation of Ser. No. 634,136, Nov. 21, 1975, abandoned. This application Jun. 28, 1978, Ser. No. 919,963

Int. Cl.[2] **C09K** *3/28*

U.S. Cl. 252—8.1 **4 Claims**

1. A storage stable premix for reaction with an organic polyisocyanate to form a fire retardant polyurethane foam, said premix comprising:
(a) an O,O'-bis(hydroxyalkyl) N,N-di(lower-alkyl)aminomethanephosphonate having the following formula:



wherein R_1, R_2, R_3, and R_4 are each independently selected from the class consisting of hydrogen and lower-alkyl, and R_5 and R_6 each independently represent lower-alkyl; and
(b) a polyol selected from the class consisting of polyether polyols and polyester polyols having an equivalent weight from about 90 to about 2000 and a functionality from 2 to 6.

4,202,780

METHOD FOR IMPROVING THE LUBRICATING PROPERTIES OF SOLID LUBRICANTS

Marcel C. Brendle, Wittenheim, France, assignor to Dow Corning GmbH, Munich, Fed. Rep. of Germany

Filed Jul. 1, 1976, Ser. No. 701,922

Claims priority, application Fed. Rep. of Germany, Jul. 4, 1975, 2530002

Int. Cl.[2] **C10M** *7/10, 7/30, 7/48*

U.S. Cl. 252—12 **12 Claims**

1. A process for improving the lubricating properties of solid lubricants characterized by modifying the solid lubricants by
(A) contacting finely divided solid lubricants with an organic solvent solution of reactive organic polymer;
(B) allowing the finely divided solid lubricant to remain in contact with the solvent solution of reactive organic polymer for a period sufficient to allow the solid lubricant to react with the reactive polymer and attach the organic polymer to the solid lubricant;
(C) washing the reaction product free of impurities using organic solvents;
(D) removing the solvent and recovering the solid lubricant that has been so modified,

whereby a solid lubricant is obtained which has improved lubricating properties.

8. A composition of matter which is a solid lubricant which is chemically bonded with an organic polymer.

10. The use of a modified solid lubricant for lubricating purposes which solid lubricant has been modified by

(A) contacting a finely divided solid lubricant with a reactive gas;

(B) allowing the solid lubricant and the gas to remain in contact for a period of time sufficient to allow the gas to react with the solid lubricant;

(C) recovering the solid lubricant that has been so modified.

4,202,781

PROCESS FOR MAKING MOLYBDENUM PHOSPHOSULFURIZED HYDROCARBON COMPOSITION

Albert R. Sabol, Munster, Ind., and Ernest H. Baughman, Naperville, Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Oct. 31, 1978, Ser. No. 956,281

Int. Cl.[2] C10M *1/48, 3/42;* **C07F** *11/00*

U.S. Cl. 252—32.7 HC **8 Claims**

1. A method for preparing a molybdenum-containing phosphosulfurized hydrocarhon composition which comprises reacting an aqueous solution of a molybdenum compound with a phosphosulfurized hydrocarbon and removing substantially all the water.

4,202,782

MULTIFUNCTIONAL ADDITIVES FOR LUBRICANTS

Lester A. Doe, Jr., Newtown, and Lester A. Brooks, Norwalk, both of Conn., assignors to R. T. Vanderbilt Company, Inc., Norwalk, Conn.

Filed Jun. 12, 1978, Ser. No. 914,839

Int. Cl.[2] C10M *1/32;* **C09K** *15/20;* **C07C** *85/18*

U.S. Cl. 252—51.5 A **5 Claims**

1. An oil soluble condensation product characterized by having a predominantly linear structure and prepared by reacting diphenylamine and 2-octanone in the molar ratio of about 1:1.6 at reflux temperature in the presence of acid condensation catalyst.

3. A corrosion and oxidation inhibiting composition comprising about 5 to 1 parts by weight p,p'-dioctyldiphenylamine and about 1 to 3 parts by weight condensation product characterized by having a predominantly linear structure and prepared by reacting diphenylamine and 2-octanone in the molar ratio of about 1:1.6 at reflux temperature and in the presence of acid condensation catalyst.

4. A lubricating composition comprising a major portion of oil of lubricating viscosity and about 1.5 to 2.0 parts by weight per hundred parts oil of a corrosion and oxidation inhibiting composition comprising about 5 to 1 parts by weight p,p'-dioctyldiphenylamine and about 1 to 3 parts by weight condensation product characterized by having a predominantly linear structure and prepared by reacting diphenylamine and 2-octanone in the molar ratio of about 1:1.6 at reflux temperature and in the presence of acid condensation catalyst.

4,202,783

ANTIOXIDANT ADDITIVES AND LUBRICANT COMPOSITIONS CONTAINING SAME

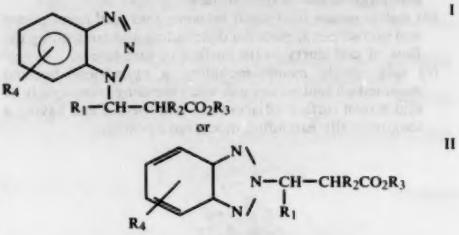
Sheldon Chibnik, Cherry Hill, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 28, 1978, Ser. No. 937,667

Int. Cl.[2] C10M *1/20, 1/32;* **C07D** *249/18*

U.S. Cl. 252—51.5 A **22 Claims**

1. A compound or mixture of compounds prepared by reacting under suitable conditions a benzotriazole and an unsaturated ester and thereafter recovering as final product



I

or

II

or mixtures thereof where R_1 and R_2=H or C_1 to C_8 alkyl and R_3 is selected from methyl, ethylhexyl, hydroxyethyl and tetraethylenegycol acrylate, and C_2 to C_{22} or mixtures of C_2–C_{22} and R_4=H or CH_3.

4,202,784

TERTIARY CARBINAMINE MODIFIED MANNICH COMPOSITIONS AND LUBRICANTS CONTAINING SAME

Paul J. Cahill, and John H. Udelhofen, both of Wheaton, Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Apr. 9, 1979, Ser. No. 28,566

Int. Cl.[2] C10M *1/32*

U.S. Cl. 252—51.5 R **8 Claims**

1. A Mannich composition comprising the reaction product of a substantially hydrocarbon compound having at least one acidic or active hydrogen selected from the group consisting of alkyl phenols, alkyl naphthols and oxidized olefin polymers, formaldehyde or a formaldehyde-yielding compound, a polyamine and a tertiary alkyl carbinamine.

5. A composition comprising the reaction product of an alkyl phenol, 0.1 to 10 moles of a polyamine per mole of phenol, 0.1 to 10 moles of formaldehyde or a formaldehyde-yielding reagent per mole of phenol, and 0.1 to 10 moles of a tertiary alkyl carbinamine per mole of the phenol at a temperature of about 60° C. to about 300° C.

6. A lubricant composition containing a major portion of a lubricating oil and an effective amount of from 1.0 to 50.0 weight percent of composition of claim 1 or claim 5.

4,202,785

POLYESTERIONOMERS HAVING UTILITY IN LIQUID ELECTROGRAPHIC DEVELOPER COMPOSITIONS

Stewart H. Merrill; Susan E. Hartman; John M. Noonan, all of Rochester; Mohammad A. Sandhu, and Domenic Santilli, both of Webster, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 15, 1978, Ser. No. 906,174

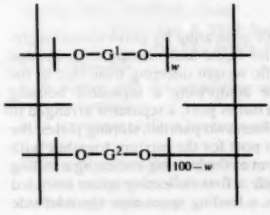
Int. Cl.[2] G03G *9/12*

U.S. Cl. 430—106 **11 Claims**

1. A liquid electrographic developer composition comprising

(a) an electrically insulating liquid; and

(b) a polymeric binder having the following structure



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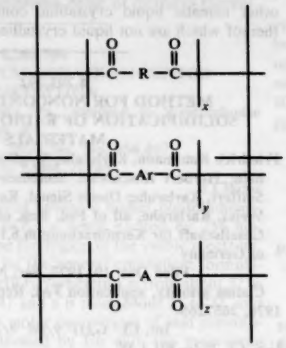


wherein

G^1 represents a straight or branched chain alkylene having about 2 to 12 carbon atoms, or, substituted or unsubstituted, cycloalkylene, cycloalkylenebis(oxyalkylene) or cycloalkylenedialkylene;

G^2 represents, substituted and unsubstituted, arylene, cycloalkylene or a straight or branched chain oxygen free alkylene having about 2 to 12 carbon atoms;

R and Ar, which are always different, represent 1,1,3-trimethyl-3-phenylindan-5, 4'-diyl, or an unsaturated, substituted or unsubstituted alicyclic group having 7–10 carbon atoms or a substituted or unsubstituted moiety selected from the group consisting of alkylene, cycloalkylene, sulfonyldiarylene, arylene, arylenevinylene, arylenealkylene, arylenebisvinylene or arylenebisalkylene;

A represents a sulfoarylene, sulfoaryloxyarylene, sulfocycloalkylene, iminodisulfonylarylene, iminobis(sulfonylarylene), sulfoaryloxysulfonylarylene and sulfoaralkylarylene or the alkali metal or ammonium salt thereof;

said G^1, G^2, R and Ar substituents are selected from the group consisting of alkyl, alkoxy, nitro, carboxyl, halo and cyano;

w is about 50 to about 100 mole percent of the total diol component; and of the total acid component;

x is about 25 to about 95 mole percent;

y is about 1 to about 74 mole percent; and

z is about 4 to about 15 mole percent.

4,202,786

PEROXYGEN BLEACHING AND COMPOSITIONS THEREFOR

Gaylen R. Brubaker, Lawrenceville, N.J., assignor to FMC Corporation, Philadelphia, Pa.

Filed Dec. 22, 1978, Ser. No. 972,572
Int. Cl.[2] C11D 7/54
U.S. Cl. 252—102 **13 Claims**

7. A bleaching composition consisting essentially of a peroxygen bleaching compound and as a peroxygen activator therefor a carbodiimide of the formula:

$$R_1—(X)_{n-1}—N=C=N—(X')_{n-1}—R_2$$

wherein R_1 and R_2 each represent alkyl of 1 to 16 carbon atoms; cycloalkyl of 3 to 7 carbon atoms; phenyl; lower alkylphenyl; lower alkylnaphthyl; naphthyl and heterocyclic of 1 to 2 fused rings each having 5 to 6 members of which 1 to 2 are heteroatoms selected from the class consisting of nitrogen, oxygen and sulfur, it being provided that the aforesaid values of R_1 and R_2 may bear optional substituents selected from the group consisting of $—NO_2$, —Cl, —Br, alkoxy, amino, cyano, hydroxyl, —O—, —NH—, quaternary nitrogen, $—SO_3H$ and —COOH and X is a carbonyl or sulfonyl and n is an integer of 1 or 2.

4,202,787

PROTEC 3 CLEANING SOLUTION

C. Paul Davis, 18360 Oxnard St., Tarzana, Calif. 91356

Filed Feb. 6, 1979, Ser. No. 9,775
Int. Cl.[2] C23G 5/02; C11D 7/52
U.S. Cl. 252—171 **2 Claims**

1. A cleaning composition for records, magnetic discs, and tape heads consisting of:

(a) from about 80–90% of trichlorotrifluoroethane;

(b) from about 5–20% of isopropyl alcohol;

(c) from about 0.051–0.254% of a fatty quaternary ammonium compound; and

(d) from about 0.019–0.047% of a short-chain tetrafluoroethylene telomer dispersed in said trichlorotrifluoroethane.

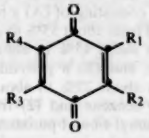
4,202,788

STABILIZATION OF AQUEOUS P-BENZOQUINONES

Joseph S. Zannucci, and John W. Thompson, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 12, 1979, Ser. No. 11,603
Int. Cl.[2] C09K 3/00
U.S. Cl. 252—182 **12 Claims**

1. A stable composition of matter comprising in an aqueous system a compound of the formula



I

where R_1, R_2, R_3 and R_4 may be the same or different and are selected from hydrogen; hydroxyl; cyano; nitro; halogen; straight or branched alkyl and alkylene of 1–20 carbons both of which may be substituted with 1–3 groups selected from formyl, formyloxy, alkoxycarbonyl of 1–8 carbons, alkoxycarbonyloxy of 1–8 carbons, carbamoyl, alkylcarbamoyl of 1–8 carbons, —CN, alkoxy of 1–8 carbons, and aryl and cycloalkyl of 6–10 carbons each of which also may be substituted with 1–3 halogens, alkyl of 1–8 carbons, alkoxy of 1–8 carbons, and —CN; mercapto; thioethers of 1–10 carbons; alkylthio of 1–10 carbons; sulfonic or sulfinic acid or ester groups of 1–10 carbons; amino; alkylamino of 1–8 carbons; dialkylamino of 2–16 carbons; alkyl arylamino of 1–8 carbons in the alkyl group and 6–10 carbons in the aryl group; arylamino of 6–10 carbons which may be substituted with 1–3 halogens, $—NO_2$, alkyl of 1–8 carbons, alkoxy of 1–8 carbons, and —CN; alkoxycarbonyl of 1–8 carbons; alkoxycarbonyloxy of 1–8 carbons; carbamoyl; alkylcarbamoyl of 1–8 carbons; diarylamino of 12 to 20 carbons which may be substituted with 1–3 halogens, alkyl of 1–8 carbons, alkoxy of 1–8 carbons, and —CN; cycloalkylamino which may be substituted with 1–3 halogens, alkyl of 1–8 carbons, alkoxy of 1–8 carbons, and —CN; acyl, acylamino and acyloxy of straight or branched alkyl of 1–20 carbons or aryl of 6–10 carbons, each of which may be substituted with halogen, alkyl or alkoxy of 1–8 carbons, nitro, or cycloalkyl of 5–18 carbons which may be substituted with 1–3 halogens, alkyl of 1–8 carbons, alkoxy of 1–8 carbons, or —CN; aryl of 6–32 carbons which may be substituted with 1–3 halogens, alkyl of 1–8 carbons, alkoxy of 1–8 carbons, or —CN; and alkoxy of 1–20 carbons which may be substituted with 1–3 halogens, alkoxy of 1–8 carbons, and —CN; admixed with from about 0.5 to about 25.0% by weight of one or more water-soluble acidic or neutral inorganic salts of Groups IA and IIA elements of the Periodic Table, or of nickel.

4,202,789

POSITIVE COBALT ELECTRODE FOR ALKALINE STORAGE BATTERIES AND PROCESS FOR ITS PRODUCTION

Nikolaus Saridakis, Brunswick, Fed. Rep. of Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Filed Jun. 28, 1978, Ser. No. 919,828

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1977, 2731063

Int. Cl.[2] H01M *4/48;* C01G *51/04*

U.S. Cl. 252—182.1 15 Claims

1. A cobalt electrode for use as a positive electrode in alkaline storage batteries, said electrode containing aluminum hydroxide.

2. A process for the production of a positive cobalt electrode for alkaline storage batteries comprising the steps of immersing a porous supporting grid of conducting material in an impregnating solution containing a cobalt salt dissolved in a solvent and at least one aluminum salt in solution, and subsequently immersing said grid in an alkaline medium for precipating out hydroxides.

4,202,790

PEROXIDE BLENDS

Kenneth E. Steller, New Castle County, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Jun. 26, 1978, Ser. No. 919,096

Int. Cl.[2] C08F *8/06;* C08J *3/24;* C07C *179/14, 179/06*

U.S. Cl. 252—186 7 Claims

1. A peroxide blend that is liquid at room temperature selected from the group consisting of (A) a peroxide blend consisting essentially of (1) from about 55% to about 25% dicumyl peroxide and (2) from about 45% to about 75% cumyl isopropylcumyl peroxide, and (B) a peroxide blend consisting essentially of (1) from about 25% to about 10% bis(alpha-t-butylperoxyisopropyl) benzene and (2) from about 75% to about 90% isopropylcumyl t-butyl peroxide.

4,202,791

NEMATIC LIQUID CRYSTALLINE MATERIALS

Hisato Sato, Tabata; Haruyoshi Takatsu, Kodaira, and Masayuki Tazume, Urawa, all of Japan, assignors to Dainippon Ink & Chemicals Inc., Tokyo, Japan

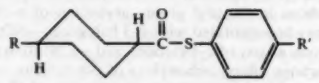
Filed Feb. 14, 1979, Ser. No. 11,798

Claims priority, application Japan, Feb. 17, 1978, 53-16566

Int. Cl.[2] C09K *3/34;* G02F *1/13;* C07C *153/09*

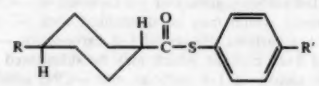
U.S. Cl. 252—299 25 Claims

1. A trans(equatorial-equatorial)1,4-disubstituted cyclohexane derivative of the general formula



wherein R represents a linear alkyl group containing 3 to 7 carbon atoms and R′ represents a linear alkoxy group containing 2 to 5 carbon atoms or a cyano group.

3. A nematic liquid crystalline composition comprising at least one trans(equatorial-equatorial)1,4-disubstituted cyclohexane derivative, a nematic liquid crystalline compounds, of the general formula



wherein R represents a linear alkyl group containing 3 to 7 carbon atoms, and R′ represents a linear alkoxy group containing 2 to 5 carbon atoms or a cyano group, and at least one additional component selected from the group consisting of other nematic liquid crystalline compounds and homologs thereof which are not liquid crystalline.

4,202,792

METHOD FOR NONCONTAMINATING SOLIDIFICATION OF RADIOACTIVE WASTE MATERIALS

Friedrich Kaufmann, Karlsruhe; Siegfried Weisenburger, Au/Rhein; Herbert Koschorke, Stutensee-Friedrichstal; Hartmut Seiffert, Karlsruhe; Dieter Sienel, Karlsruhe, and Karl-Heinz Weiss, Karlsruhe, all of Fed. Rep. of Germany, assignors to Gesellschaft fur Kernforschung m.b.H., Karlsruhe, Fed. Rep. of Germany

Filed Dec. 19, 1977, Ser. No. 862,048

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1976, 2657265

Int. Cl.[2] G21F *9/08, 9/14, 9/16*

U.S. Cl. 252—301.1 W 7 Claims

7. Method for the solidification, in a manner which protects the environment against contamination, of waste materials obtained during reprocessing of irradiated nuclear fuel and/or breeder materials in a matrix of borosilicate glass, comprising:

(a) mixing a waste liquid which has been obtained from a reprocessing system without pretreatment with glass formers and formic acid to reduce nitric acid and nitrate ions present in said waste liquid, the amount of said formic acid being equal to two to three times the stoichiometrically required amount;

(b) introducing the mixture obtained from step (a) in an amount between 10 l/h to about 150 l/h with the aid of air or another gas, into the center of a borosilicate glass melt disposed in a melting crucible at a temperature in the region of 1000° to 1400° C. to form an island drying and calcinating zone extending up to about two-thirds of said melt surface while avoiding contact of the waste liquid with the walls of the crucible, to form a reducing atmosphere, and to substantially avoid the presence of resulting waste gases which would radiologically and/or chemically contaminate the environment.

4,202,793

PRODUCTION OF MICROSPHERES OF THORIUM OXIDE, URANIUM OXIDE AND PLUTONIUM OXIDE AND THEIR MIXTURES CONTAINING CARBON

Giovanni Bezzi, Bagnacavallo; Alessandro Facchini, San Donato Milanese; Giovanni Martignani, Bagnacavallo, and Michele Pastore, San Donato Milanese, all of Italy, assignors to Agip Nucleare S.p.A., San Donato Milanese, Italy

Continuation of Ser. No. 518,191, Oct. 25, 1974, abandoned. This application Jul. 1, 1977, Ser. No. 812,336

Claims priority, application Italy, Oct. 26, 1973, 30598 A/73

Int. Cl.[2] C09K *3/00;* G21G *4/04*

U.S. Cl. 252—301.1 S 5 Claims

1. A process for the production of carbon containing microspheres of thorium oxide, uranium oxide, plutonium oxide or mixtures thereof, said process comprising:

(a) preparing a solution by mixing a salt of thorium, uranium or plutonium or a mixture thereof and an aqueous alkaline medium containing a polymerizable organic compound which is capable of forming a carbonizable polymer and if necessary an agent to make the polymerizable organic compound miscible with said aqueous alkaline medium;

(b) forming microspheres by adding the mixture of steo (a) dripwise to an alkaline solution which is sufficiently alkaline whereby the salts precipitate and the polymerizable organic compound polymerizes;

(c) washing the microspheres with water to remove foreign ions; and

(d) heating the microspheres in an atmosphere which comprises hydrogen to carbonize the organic polymer and

form the carbon containing microspheres of thorium oxide, uranium oxide, plutonium oxide or mixtures thereof.

4,202,794

CALCIUM YTTRIUM BORATE PHOSPHOR COMPOSITION

Willi Lehmann, Murrysville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 25, 1978, Ser. No. 954,497
Int. Cl.[2] C09K *11/46*
U.S. Cl. 252—301.4 R 3 Claims

1. A phosphor composition having a higher photoluminescent efficiency than $CaYBO_4$:Eu when excited by 254 nm. radiation and emitting in the red region of the visible spectrum, said phosphor expressible by the general constituent formulation $xCaO.y(Y+Eu)O_{3/2}.zBO_{3/2}$ wherein x is from about 32 to 38, y is from about 31 to 41 and z is from about 25 to 31, and x, y and z express relative molar proportions of said constituents, said phosphor is activated by Eu with the gram-atom ratio of Y to Eu being from about 5:1 to 40:1, and the relative molar proportions of said phosphor constituents fall within the cross-hatched area of the ternary phase diagram as shown in FIG. 1.

4,202,795

METHODS AND ADDITIVES FOR DELAYING THE RELEASE OF CHEMICALS IN AQUEOUS FLUIDS

John W. Burnham; James E. Briscoe, and Eugene A. Elphingstone, all of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Sep. 28, 1978, Ser. No. 946,471
Int. Cl.[2] B01D *17/04*
U.S. Cl. 252—332 33 Claims

1. A method of delaying the release of a chemical in an aqueous fluid comprising the steps of:

mixing said chemical with a solid hydratable gelling agent and a breaker for the gel produced by said gelling agent when hydrated;

forming the resultant mixture into solid pellets; and

combining said pellets with said aqueous fluid whereby said gelling agent in said pellets is hydrated and forms a protective gel around said pellets for the period of time required for said protective gel to be broken by said breaker in said pellets whereupon said chemical is released into said aqueous fluid

wherein said gelling agent is selected from hydratable polysaccharides, polyacrylamides, polyacrylamide copolymers and polyvinyl alcohol,

said gelling agent being present in said mixture in an amount in the range of from about 0.99 to about 99.99 percent by weight of said mixture, and

wherein said breaker for said gel is selected from mild oxidizing agents, enzymes, acids and mixtures thereof,

said breaker for said gel being present in an amount in the range of from about 0.01 to about 50 percent by weight of said mixture and still further

wherein said chemical is present in said mixture in an amount in the range of from about 1 to about 99 percent by weight of said mixture.

4,202,796

ANTI-CORROSION COMPOSITION

Jose T. Jacob, Lake Zurich, Ill., and Vincent R. Kuhn, Twin Lakes, Wis., assignors to Chemed Corporation, Cincinnati, Ohio

Filed Jul. 31, 1978, Ser. No. 929,272
Int. Cl.[2] C23F *11/16, 11/14, 11/18*
U.S. Cl. 252—389 A 11 Claims

1. Composition consisting essentially of

(A) sorbitol;

(B) a member selected from the group consisting of benzotriazole and tolyltriazole; and

(C) a water-soluble phosphate.

8. Process of inhibiting ferrous corrosion in an aqueous system comprising maintaining therein (A) sorbitol; (B) a member selected from the group consisting of benzotriazole and tolyltriazole; and (C) a water-soluble phosphate, wherein the weight ratio of the components A:B:C is 0.01 to 100 : 0.01 to 100 :1, and component C is maintained at about 0.01 to 5000 ppm.

4,202,797

RECOVERING CATALYST VALUES IN REACTION LIQUORS FROM OXIDATIVE PRODUCTION OF CARBOXYLIC AND POLYCARBOXILIC ACIDS

Peter J. V. Jones, Middlesbrough, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Feb. 27, 1978, Ser. No. 882,206
Claims priority, application United Kingdom, Apr. 7, 1977, 14834/77
Int. Cl.[2] B01J *27/32, 27/28;* C07C *51/42;* C01G *45/00, 51/00*
U.S. Cl. 252—413 9 Claims

1. A process for recovering catalyst values comprising heavy metal ions and bromide ions from the reaction mother liquor resulting from the oxidation in the liquid phase to a mono aromatic carboxylic acid product or a polycarboxylic acid product of a feedstock oxidisable thereto by means of a molecular oxygen-containing gas in presence of a lower aliphatic monocarboxylic acid and of a catalyst comprising said heavy metal ions and said bromide ions followed by separation of the same mono or polycarboxylic acid product from the said reaction mother liquor, which process comprises,

(1) concentrating the said reaction mother liquor, when necessary, until the concentration of said heavy metal ions in the concentrate is at least 1000 parts per million (p.p.m.) by weight,

(2) adding sulphuric acid to the said concentrate to precipitate said heavy metal ions as their sulphates,

(3) separating said heavy metal sulphates from the sulphate precipitation mother liquor,

(4) distilling the sulphate precipitation mother liquor to obtain an overhead fraction comprising lower aliphatic monocarboxylic acid, hydrogen bromide and water, which fraction is condensed to a liquid,

(5) dissolving the precipitated heavy metal sulphates from step 3 in water,

(6) contacting the aqueous heavy metal sulphate solution with a cation exchange resin whereby the heavy metal values are absorbed on said resin and an aqueous solution of sulphuric acid is obtained, and

(7) eluting the heavy metal values from the said cation exchange resin with a solution of hydrogen bromide in said lower aliphatic carboxylic acid recovered from step 4.

4,202,798

PHOSPHOROUS-CONTAINING CATALYST AND METHOD FOR PREPARING AND USING SAME

Marvin F. L. Johnson, Homewood, and Henry Erickson, Park Forest, both of Ill., assignors to Atlantic Richfield Company, Philadelphia, Pa.

Continuation of Ser. No. 559,983, Mar. 19, 1975, abandoned, which is a continuation of Ser. No. 369,265, Jun. 12, 1973, abandoned. This application Oct. 30, 1978, Ser. No. 955,661
Int. Cl.[2] B01J *27/18*
U.S. Cl. 252—437 8 Claims

1. In a method for producing an improved final catalyst comprising a major amount of alumina and a minor amount effective to promote hydrocarbon hydrotreating of at least one metal component selected from the group consisting of Group VIB metal components, Group VIII metal components and mixtures thereof which comprises the steps of contacting calcined alumina with at least one said metal-containing compound thereby forming a metal-containing material, calcining

said metal-containing material and forming said final catalyst wherein the improvement which consists essentially of:

(1) contacting an aqueous slurry consisting essentially of hydrous alumina with at least one phosphorus acid present in an amount sufficient to provide said final catalyst with a minor amount effective to increase the hydrocarbon hydrotreating activity of the final catalyst of phosphorus and forming a phosphorus-containing hydrous alumina, said phosphorus acid being selected from the group consisting of phosphoric acids, phosphonic acids, phosphinic acids, phosphenic acids, phosphoranic acids, phosphoranedioic acids, phosphoranetrioic acids, phosphoranetetroic acids, phosphoranepentoic acids and mixtures thereof, and

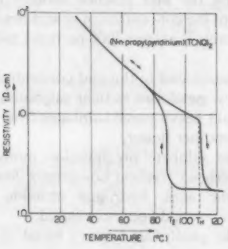
(2) calcining said phosphorus-containing hydrous alumina and forming said calcined alumina.

4,202,799

ORGANIC-HEAT-SENSITIVE SEMICONDUCTIVE COMPOUNDS

Susumu Yoshimura; Mutsuaki Murakami, and Midori Shinoda, all of Kawasaki, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jun. 13, 1978, Ser. No. 915,259
Claims priority, application Japan, Jun. 17, 1977, 52-72419
Int. Cl.[2] H01C *31/00*
U.S. Cl. 252—500 **5 Claims**



1. An organic heat-sensitive semiconductive compound of an (N-n-propylpyridinium)$(TCNQ)_2$ complex salt and an (N-n-alkylthiazolium)$(TCNQ)_2$ complex salt wherein the alkyl moiety is propyl or butyl.

4,202,800

LIQUID LAUNDRY DETERGENT COMPRISING A NONIONIC SURFACTANT AND AN ALKANOLAMINE

John D. Ciko, Lindenhurst, Ill.; Robert A. Ward, Cleveland Heights, Ohio, and John J. Cramer, Grosse Ile, Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Continuation-in-part of Ser. No. 628,357, Nov. 3, 1975, abandoned. This application Jul. 5, 1977, Ser. No. 812,452
Int. Cl.[2] C11D *1/66, 3/30*
U.S. Cl. 252—543 **18 Claims**

1. A liquid fabric-cleaning detergent consisting essentially of

a. from 15 to 30 weight percent of at least one nonionic surfactant having an HLB of 5 to 14,

b. from 0.15 to 0.50 weight percent of sodium carboxymethylcellulose,

c. from 10 to 30 weight percent of a lower alkanolamine effective to promote the action of said nonionic surfactant, and

d. water in an amount of 20 to 70 weight percent.

4,202,801

THERMOPLASTIC ELASTOMER COMPOSITION

Henno A. Petersen, Newtown, Conn., assignor to Uniroyal, Inc., New York, N.Y.

Filed Dec. 30, 1977, Ser. No. 866,184
Int. Cl.[2] C08L *7/00, 9/00, 11/00, 47/00*
U.S. Cl. 260—5 **32 Claims**

1. A thermoplastic elastomer comprising a dynamically partially cured blend of 10% to 80% monoolefin copolymer rubber, said monoolefin copolymer being an amorphous, random, elastomeric copolymer of two or more monoolefins, at least one of said monoolefins being ethylene, 5% to 50% polyolefin resin, said resin being a solid, high molecular weight resinous plastic material, and 10% to 80% conjugated diene natural or synthetic rubber having an amount of unsaturation on the order of that occurring in Hevea rubber, wherein the percentages are percent by weight of the total composition, said blend being crosslinked only to an extent that will not prevent its becoming knit together into a coherent mass when processed on conventional rubber or plastic processing machinery.

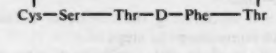
4,202,802

PEPTIDES RELATED TO SOMATOSTATIN

James E. Shields, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Oct. 2, 1978, Ser. No. 948,117
Int. Cl.[2] C08L *89/00*; C07C *103/52*; A61K *37/00*
U.S. Cl. 260—8 **20 Claims**

1. A cyclic tetradecapeptide of the formula:



wherein:

X is H—Ala—D—Ala, H—D—Ala—Gly, or H—D—Val—Gly; and

X^1 is Ala—Leu, Ala—Phe, Ala—D—Phe, D—Ala—Phe, or D—Ala—Cha; or a non-toxic, pharmaceutically acceptable acid addition salt thereof.

4,202,803

RUBBER COMPOSITION CONTAINING GROUND GRAMINACEOUS RICE PRODUCT ESPECIALLY FOR MANUFACTURING MOLDED PANELS

Teresio Signoretto, Frazione Allivellatori 61, Cumiana (Turin), Italy

Filed Jun. 20, 1978, Ser. No. 917,228
Claims priority, application Italy, Jun. 20, 1977, 68427 A/77
Int. Cl.[2] C08L *5/00*
U.S. Cl. 260—17.4 BB **9 Claims**

1. In a composition for the manufacture of a vulcanized rubber for manufacturing a moulded panel including an elastomer and a vulcanizing agent, the improvement wherein the composition further includes as a filler, at least one member selected from the group consisting of rice husks and rice chaff.

4,202,804

VISCOSITY STABLE, STAINABLE WOOD TEXTURED CAULKING COMPOSITION CONTAINING WATER IMMISCIBLE ORGANIC SOLVENT

Rita E. Porzel, Lisle, and Cathryn D. Bator, Hoffman Estates, both of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Filed Sep. 11, 1978, Ser. No. 941,184
Int. Cl.[2] C08L *1/02*
U.S. Cl. 260—17.4 R **13 Claims**

1. A viscosity stable, stainable, wood textured, aqueous latex caulking composition comprising from 5% to 30% of the weight of the composition of wood particles having sorbed therein a water immiscible organic solvent in an amount of at

least about 60% of the weight of the wood to provide a free-flowing, solvent-wet powder; from about 35% to about 70% by weight of the composition of an aqueous emulsion of film-forming plasticized resin particles coalescable at about −40° C.; the proportion of wood particles, the resin solids content of said aqueous emulsion and the plasticization of the resin particles providing a viscous mass of gunable viscosity, and said organic solvent providing viscosity stability.

4,202,805

COATING RESIN COMPOSITION

Nobukatsu Kato, Nagoya; Yoshio Morimoto, Tokai, and Hiroshi Ozawa, Yokohama, all of Japan, assignors to Mitsui Toatsu Chemicals Incorporated, Tokyo, Japan

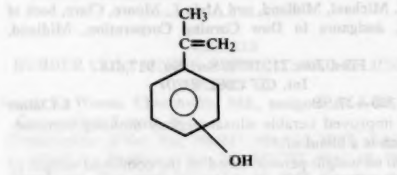
Filed Nov. 13, 1978, Ser. No. 959,766

Claims priority, application Japan, Nov. 24, 1977, 52-139908

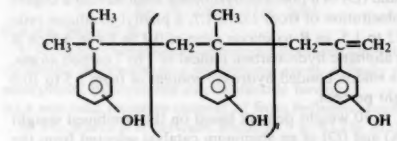
Int. Cl.[2] C09D *3/74, 5/08*

U.S. Cl. 260—22 CB **8 Claims**

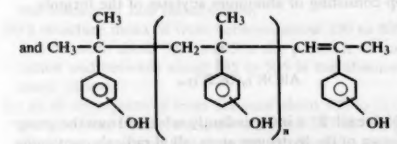
1. A coating resin composition comprising the reaction product obtained by reacting at least one isopropenylphenol compound selected from the group consisting of the compounds of the formulas



(I)



(II)



(III)

wherein n is a whole number of from 0 to 18, with at least one unsaturated compound selected from the group consisting of straight-chain unsaturated fatty acids, unsaturated fats and oils composed mainly of glycerides of straight-chain unsaturated fatty acids, polymers of diene hydrocarbon, polymers of diene hydrocarbon having carboxyl substituents at the ends of the polymer molecule, polymers of diene hydrocarbons having hydroxyl substituents at the ends of the polymer molecule, and maleinized polymers of diene hydrocarbon; and then reacting the resulting intermediate product with at least one polyfunctional compound selected from the group consisting of polyhydric alcohols and organic polybasic acids.

4,202,806

STABILIZATION OF CHLORINE-CONTAINING RESINS

Norio Yoshida, Hirakata, and Takesi Matuyama, Sakai, both of Japan, assignors to Koei Chemical Co., Ltd., Osaka, Japan

Filed Apr. 20, 1978, Ser. No. 898,286

Claims priority, application Japan, Apr. 22, 1977, 52-46968; Apr. 22, 1977, 52-46969; May 23, 1977, 52-60019; Feb. 28, 1978, 53-23101

Int. Cl.[2] C08K *5/11, 5/12*

U.S. Cl. 260—23 XA **11 Claims**

1. A chlorine-containing resin consisting essentially of:

(1) a chlorine-containing resin selected from the group consisting of homopolymer of vinyl chloride, homopolymer of vinylidene chloride and copolymers of vinyl chloride and an olefin copolymerizable therewith,

(2) 0.1 to 10 parts by weight, to 100 parts by weight of said chlorine-containing resin, of a heat stabilizer selected from the group consisting of (a) a partial esterification product of a polyol and an aliphatic acid, having a hydroxyl content of 10% to 40% by weight, said polyol being a member selected from the group consisting of pentaerythritol, polypentaerythritols and their dehydration condensation products, and said aliphatic acid being a member selected from the group consisting of aliphatic polycarboxylic acids and their esters, acid halides and acid anhydrides and (b) a partial esterification product of a polyol and an aromatic acid, having a hydroxyl content of 10% to 40% by weight, said polyol being a member selected from the group consisting of polypentaerythritols and dehydration condensation products of pentaerythritol and/or polypentaerythritols, and said aromatic acid being a member selected from the group consisting of aromatic polycarboxylic acids and their esters, acid halides and acid anhydrides, and

(3) an organic acid zinc salt.

4,202,807

ORGANOPOLYSILOXANE COMPOSITIONS MODIFIED WITH POLYURETHANE

Hans-Heinrich Moretto, Cologne; Armand de Montigny; Helmut Steinberger, both of Leverkusen; Hans Sattlegger, Odenthal-Gloebusch, all of Fed. Rep. of Germany, and Ingrid Larking, Landvetter, Sweden, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

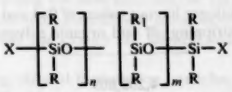
Filed Jun. 21, 1978, Ser. No. 917,717

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1977, 2730744

Int. Cl.[2] C08L *75/04, 83/04*

U.S. Cl. 260—29.1 SB **6 Claims**

1. A process for producing a composition comprising a polysiloxane and a polyurethane each present as a discernible phase comprising mixing at a temperature from about room temperature to about 150° C. a liquid polysiloxane of the formula



in which

R is an alkyl, alkenyl, aryl or halogenoalkyl radical with up to about 10 C atoms,

R′ is hydrogen, or an alkyl, alkenyl, aryl or halogenoalkyl radical with up to about 10 C atoms,

X is hydroxyl, vinyl or methyl,

n is 2 to about 1,000, and

m is 1 to about 50,

the polysiloxane having a viscosity of the order of about 10,000 centipoise, with a material which with a polyisocyanate will form a polyurethane, thereafter adding to said mixture a polyisocyanate of the formula

$$OCN—R^1—NCO$$

in which

R^1 is an optionally substituted alkylene or arylene radical with up to 24 C atoms,

thereby to form said polyurethane as a discernible phase in the liquid polysiloxane, the proportions of polysiloxane, polyurethane-forming material and polyisocyanate being such that the formed polyurethane constitutes about 40–80% of the weight of polysiloxane plus polyurethane.

4,202,808

VINYL RESIN LATEX COATING COMPOSITIONS

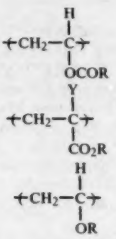
You-Ling Fan, East Brunswick, N.J., assignor to Union Carbide Corporation, New York, N.Y.

Filed Mar. 13, 1978, Ser. No. 886,091

Int. Cl.[2] C08L *27/06*

U.S. Cl. 260—29.6 WB **21 Claims**

1. Method of preparing water-borne colloidal dispersions of vinyl resins selected from the group consisting of vinyl chloride, vinylidene chloride or vinyl chloride/vinylidene chloride copolymers having carboxylic or sulfonic acid groups therein which comprises vigorously blending said resins with a water-miscible base, water, and at least 1 organic water-miscible solvent which has an affinity for said resins and a boiling point below about 160° C. and an organic water-miscible macromolecular compound selected from the group consisting of normally solid cellulose ethers, poly (alkylene oxides), homopolymers of vinyl alcohol, acrylic acid, methacrylic acid, vinyl pyrrolidone, maleic acid and acrylamide and copolymers of vinyl alcohol, acrylic acid, methacrylic acid, vinyl pyrrolidone, maleic acid and acrylamide containing at least one of the following lipophilic moieties copolymerized therein:

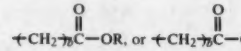


(1)

(2)

(3)

wherein Y is a monovalent radical selected from the group consisting of —H, methyl,



wherein b is an integer having values of 0–4 and R is a C_1–C_{18} alkyl, and then stripping off said organic solvent.

4,202,809

STYRENE-BUTADIENE-ACRYLONITRILE INTERPOLYMER LATEX BASED CEMENT ADDITIVES

R. Douglas Eash, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 815,966, Jul. 15, 1977, abandoned. This application Jun. 16, 1978, Ser. No. 916,168

Int. Cl.[2] C08K *3/00*

U.S. Cl. 260—29.7 S **12 Claims**

1. A cement additive consisting of (1) an interpolymer latex, said interpolymer consisting of from about 30 to about 70 parts by weight styrene, from about 30 to about 50 parts by weight butadiene and from 1 to about 20 parts by weight acrylonitrile, said latex containing up to about 60 parts by weight of interpolymer solids, and, based on 100 parts by weight of said interpolymer solids, (2) from about 3 to about 10 parts by weight of a nonionic surfactant, (3) from about 3 to about 10 parts by weight of an anionic surfactant, and (4) from about 0.1 to about 5 parts by weight of a polyorganosiloxane foam depressant.

4,202,810

APPLICATION OF CUMYLPHENOL AND DERIVATIVES THEREOF IN PLASTIC COMPOSITIONS

Salvatore J. Monte, Staten Island, N.Y., and Gerald Sugerman, Allendale, N.J., assignors to Kenrich Petrochemicals, Inc., Bayonne, N.J.

Division of Ser. No. 672,425, Mar. 31, 1976, Pat. No. 4,102,862. This application Jun. 5, 1978, Ser. No. 912,880

Int. Cl.[2] C08G *18/30, 18/83;* C08L *75/04*

U.S. Cl. 260—31.2 N **8 Claims**

1. A polymerizable composition which comprises an admixture of from 10 to 100 parts by weight of cumylphenyl glycidyl ether or a cumylphenyl ester of a carboxylic acid and 100 parts of a urethane resin.

4,202,811

SILOXANE-EPOXY MOLDING COMPOUND WITH IMPROVED CRACK RESISTANCE

Keith W. Michael, Midland, and Alvin L. Moore, Clare, both of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Jun. 21, 1978, Ser. No. 917,618

Int. Cl.[2] C08L *83/04*

U.S. Cl. 260—37 SB **8 Claims**

1. An improved curable siloxane-epoxy molding composition which is a blend of

(A) 5 to 60 weight percent based on the combined weight of (A) and (D) of a phenylpolysiloxane resin having a degree of substitution of from 1.0 to 1.7, a phenyl to silicon ratio of 0.2 to 1.5, an R to silicon ratio of 0.4 to 1.4 in which R is an aliphatic hydrocarbon radical of 1 to 3 carbon atoms, and a silicon-bonded hydroxyl content of from 2.5 to 10.0 weight percent,

(B) 0.1 to 10 weight percent based on the combined weight of (A) and (D) of an aluminum catalyst selected from the group consisting of aluminum acylates of the formula

in which each R' is independently selected from the group consisting of the hydrogen atom, alkyl radicals containing from 1 to 20 inclusive carbon atoms, and aryl and aryl containing hydrocarbon radicals containing 6 to 24 inclusive carbon atoms and n having a value from 0 to 2, condensates of such compounds,

(C) 65 to 85 weight percent based on the combined weight of (A), (B), and (D) of a silica filler, wherein the improvement comprises employing as the epoxy ingredient,

(D) 40 to 95 weight percent based on the combined weight of (A) and (D) of an aromatic polyepoxide resin which has more than one epoxide per molecule, has a Durran's melting point between 60° and 110° C., and is composed of at least 38 weight percent based on the weight of (D) of a polydiglycidyl ether of a bisphenol.

4,202,812

SILICONE RUBBER COMPOSITIONS CONTAINING EXTENDING FILLERS AND ACRYLOXYALKYLSILANES

Milton C. Murray, Bay City, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Sep. 1, 1978, Ser. No. 939,037

Int. Cl.[2] C08L 83/04

U.S. Cl. 260—37 SB 8 Claims

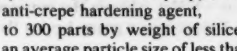
1. A composition comprising

(a) 100 parts by weight of silicone rubber base consisting essentially of polydiorganosiloxane wherein the organic radicals are selected from the group consisting of methyl, vinyl, phenyl, and 3,3,3-trifluoropropyl, reinforcing silica filler, and anti-crepe hardening agent,

(b) from 25 to 300 parts by weight of siliceous extending filler with an average particle size of less than 25 micrometers and a surface area of less than 50 m^2/g.,

(c) from 0.1 to 5 parts by weight of organic peroxide vulcanizing agent suitable for vulcanizing the silicone rubber base,

(d) from 0.08 to 0.3 part by weight of an acryloxyalkylsilane of the formula



in which R is selected from the group consisting of hydrogen and methyl radical, R′ is an alkylene radical of from 1 to 4 inclusive carbon atoms, X is a radical selected from the group consisting of lower alkoxy radicals of from 1 to 3 inclusive carbon atoms and acetoxy radical, and a is from 0 to 2 inclusive.

4,202,813

RUBBER CONTAINING PRECIPITATED SILICEOUS PRODUCTS

Satish K. Wason, Churchville, Md., assignor to J. M. Huber Corporation, Locust, N.J.

Continuation of Ser. No. 796,917, May 16, 1977, abandoned, which is a division of Ser. No. 557,707, Mar. 12, 1975, abandoned. This application Oct. 10, 1978, Ser. No. 949,719

Int. Cl.[2] C08K 3/34, 3/36

U.S. Cl. 260—37 R 1 Claim

1. A rubber composition having incorporated and intimately combined therewith, as a reinforcing agent, a finely divided, amorphous, precipitated silicon dioxide having:

(a) a wet cake moisture content of from between about 77.9 to 83.5% where it is between about 77.9 to 83.2% in the presence of a metal cation and between about 79.8 to 83.5% in the absence of said metal cation;

(b) a structure index of from between about 350 to 505 where it is between about 350 to 495 in the presence of said metal cation and between about 395 to 505 in the absence of said metal cation;

(c) an oil absorption of from between about 190 to 212 cc/100 grams where it is between about 193 to 212 cc/100 grams in the presence of said metal cation and between about 190 to 202 cc/100 grams in the absence of said metal cation;

(d) a void volume of from between about 3.19 to 4.40 cc Hg/g SiO_2 where it is between about 3.19 to 4.40 cc Hg/g SiO_2 in the presence of said metal cation and between about 3.55 to 4.14 cc Hg/g SiO_2 in the absence of said metal cation;

(e) a BET surface area of from between about 120 to 220 m^2/g where it is between about 153 to 220 m^2/g in the presence of said metal cation and between about 120 to 153 m^2/g in the absence of said metal cation; and

(f) a percent friability of from between about 20 to 98% where it is between about 28 to 93% in the presence of said metal cation and between about 20 to 98% in the absence of said metal cation;

wherein said silicon dioxide comprises at least 90% SiO_2 and said metal cation is selected from the group consisting of aluminum, magnesium, zinc and calcium.

4,202,814

PROCESS FOR THE MASS COLORATION OF POLYESTERS

Paul Lienhard, Frenkendorf, and Abul Iqbal, Ettingen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

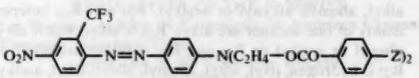
Filed Dec. 16, 1977, Ser. No. 861,327

Claims priority, application Switzerland, Dec. 27, 1976, 16350/76

Int. Cl.[2] C08K 5/23

U.S. Cl. 260—40 P 2 Claims

1. A process for the mass coloration of polyesters which comprises homogeneously mixing a dye of the formula



wherein Z represents hydrogen, chlorine, methyl or methoxy, with said polyester.

4,202,815

CONCENTRATED POWDER OR GRANULAR FORMULATIONS DISPERSABLE IN AQUEOUS MEDIA

Jacques Wegmann, Bettingen, Switzerland, assignor to Rohner AG Pratteln, Pratteln, Switzerland

Filed Mar. 20, 1978, Ser. No. 888,417

Claims priority, application Switzerland, Mar. 21, 1977, 3499/77

Int. Cl.[2] C08K 5/00

U.S. Cl. 260—42.21 15 Claims

1. A process for the preparation of aqueous-dispersible, free-flowing, and low-dusting concentrated formulations in powder or granular form of substances which are sparingly soluble to insoluble in water comprising the steps of:

(i) finely dispersing at least one of said substances, in the organic phase of a two-phase system consisting of water and an organic solvent, said organic solvent having a limited solubility in the aqueous phase,

(ii) turbulently mixing said two-phase system, containing the substance in the organic phase and having a liquid to paste-like consistency, with at least one organic carrier, said carrier having a molecular weight of at least 500, being sparingly soluble to insoluble in water, containing at least one acid group and being convertible into a water-soluble form with bases, until a homogeneous mixture has been obtained,

(iii) reducing the volume of the organic phase, said organic phase containing the substance and the carrier, by adding further water until formulation particles consisting of the substance and the carrier are formed and are no longer sticky,

(iv) separating off said formulation particles, and

(v) rinsing off with water said separated particles.

4,202,816

NOVEL LIGHT STABILIZERS

Paul Moser, Riehen, and Jean Rody, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

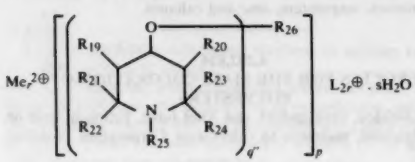
Continuation-in-part of Ser. No. 696,962, Jun. 17, 1976, abandoned. This application Nov. 7, 1977, Ser. No. 849,156

Claims priority, application Switzerland, Jun. 19, 1975, 7989/75; Dec. 2, 1975, 15651/75; Mar. 18, 1976, 3407/76

Int. Cl.[2] C08K 5/54, 5/34; C07D 211/06

U.S. Cl. 260—45.75 N 57 Claims

39. A metal complex of formula V



(V)

wherein Me is a doubly positively charged metal ion,

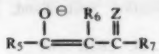
is 1 or 2,

r is equal to the number, to half the number or a quarter of the number of the >N-R_{25} groups present within the parenthesis q",

s is 0 to 2

R_{19} and R_{20} independently of one another are hydrogen, alkyl, alkenyl, alkynyl or aralkyl, R_{21} and R_{22} independently of one another are alkyl, R_{23} is alkyl, R_{24} is alkyl, phenyl or aralkyl or R_{23} and R_{24} together are alkylene, R_{25} is hydrogen, oxyl, alkyl, alkenyl, alkoxyalkyl, aralkyl, epoxyalkyl, alkoxycarbonylmethyl, alkenyloxycarbonylmethyl, phenoxycarbonylmethyl, aralkoxycarbonylmethyl, cycloalkyloxycarbonylmethyl, hydroxyalkyl or acyloxyalkyl, q" is 1, 2, 3 or 4, R_{26} is hydrogen, a mono- to trivalent, optionally substituted hydrocarbon radical or a mono- to quadrivalent radical derived from an organic or inorganic acid by the splitting-off of at least one hydroxyl group and

L is a singly charged enol anion of formula (II)



(II)

wherein Z is oxo or optionally substituted imino, R_5 is alkyl, alkenyl, cycloalkyl, aralkyl or aryl, R_6 is hydrogen, alkyl, alkenyl, cycloalkyl, aralkyl, aryl or alkoxycarbonyl, or R_5 and R_6 together are optionally substituted 1,4-butadi-1,3-enylene or 1,4-butylene, and R_7 is optionally substituted alkyl, alkenyl, cycloalkyl, aralkyl, aryl, alkoxy or optionally substituted amino.

54. A process for stabilizing organic polymers against light induced degradation comprising incorporating into said polymers 0.01 to 5% by weight of a metal complex of claim **39**.

4,202,817

PROCESS FOR THE PRODUCTION OF PENAM AND CEPHEM DERIVATIVES

Erling Guddal, Skovlunde, and Poul Borrevang, Rodovre, both of Denmark, assignors to Novo Industri A/S, Denmark

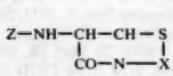
Continuation of Ser. No. 813,246, Jul. 6, 1977, abandoned. This application Sep. 18, 1978, Ser. No. 943,463

Claims priority, application United Kingdom, Jul. 7, 1976, 28346/76

Int. Cl.[2] **C07D** *499/12, 501/06*

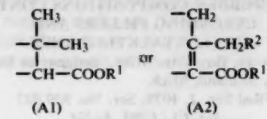
U.S. Cl. 260—239.1 **13 Claims**

1. In a process for the preparation of penam or cephem derivatives by reacting a phosphite amide of the general formula:



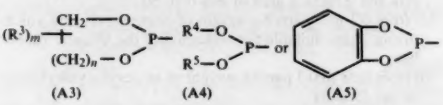
(I)

wherein X represents a group of the general formula:



(A1) (A2)

wherein the carbon atom adjacent to the $COOR^1$ group is connected to the nitrogen atom, R^1 represents a conventional penam or cephem substituted or non-substituted alkyl or aralkyl group, or a metal organic group, R^2 represents a conventional penam or cephem group selected from hydrogen, an acetoxy group, or —S-Het, wherein Het represents a heterocyclic group, and Z represents a group having the formula:

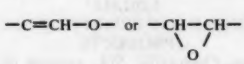


(A3) (A4) (A5)

wherein R^3 represents an alkyl group, R^4 and R^5 are the same or different, each representing an alkyl group, n represents 1 or 2, m represents 0, 1 or 2, with a p-hydroxyphenylglycyl halide or an acid addition salt thereof in an aprotic solvent, the improvement wherein the reaction is carried out in the presence of a proton donor and a phosphite halide scavenger, having the general formula:

$$R^7—Q—R^8 \qquad \text{(III)},$$

wherein Q represents a moiety of the formula



and R^7 and R^8 are the same or different, each representing hydrogen, an alkyl group optionally substituted by a chlorine atom, or a phenyl group, or R^7 and R^8 together represent trimethylene, with the proviso that any symbol R^7 or R^8 connected to the oxygen atom in the moiety Q of the formula —CH=CH—O— does not represent hydrogen, to prevent the phosphite halide produced by the reaction from reacting with water or alcohol.

4,202,818

LIPOGENESIS INHIBITION BY CERTAIN ESTERS OF SUBSTITUTED BENZODIOXINCARBOXYLIC ACIDS

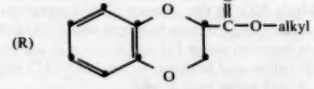
Harry G. Durham, Modesto, Calif., and John B. Carr, Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 951,535, Oct. 16, 1978, abandoned. This application Apr. 26, 1979, Ser. No. 33,634

Int. Cl.[2] **C07D** *277/00, 319/08*

U.S. Cl. 548—204 **1 Claim**

1. A compound of the formula



(R)

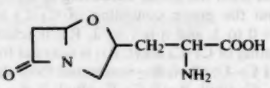
wherein "alkyl" is alkyl of from one to four carbon atoms, and R is a moiety which is one of: acetamido, (hydroxyimino)-methyl, 1-(hydroxyimino)ethyl, (methoxyimino)methyl, 1-(methoxyimino)ethyl, benzamido, and 2-methyl-4-thiazolyl.

4,202,819
2-(3-ALANYL)CLAVAM ANTIBIOTIC

Martha Kellett, Nutley; David Pruess, and James P. Scannell, both of North Caldwell, all of N.J., assignors to Hoffman-La Roche Inc., Nutley, N.J.

Filed May 4, 1979, Ser. No. 35,884
Int. Cl.[2] C07D *498/04*; A61K *31/42*
U.S. Cl. 260—245.3 **1 Claim**

1. A substantially pure compound of the formula

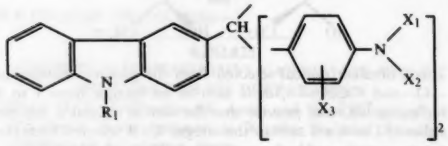


4,202,820
PRESSURE-SENSITIVE OR HEAT-SENSITIVE RECORDING MATERIAL CONTAINING A CARBAZOLYL METHANE COMPOUND

Peter Burri, Reinach, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 842,854, Oct. 17, 1977, Pat. No. 4,154,463. This application Jan. 31, 1979, Ser. No. 8,136
Claims priority, application Luxembourg, Oct. 26, 1976, 76074
Int. Cl.[2] C07D *209/86*; B41M *5/16*
U.S. Cl. 260—315 **6 Claims**

1. A carbazolylmethane compound of the formula



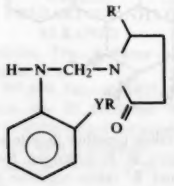
wherein R_1 is alkyl of 1 to 8 carbon atoms or benzyl, X_1 is phenyl or lower alkoxyphenyl, X_2 is lower alkyl and X_3 is hydrogen or methyl.

4,202,821
N-(N'-METHYLENEPYRROLIDONYL)-2-SUBSTITUTED ANILINES

Louis Schneider, Elizabeth, and David E. Graham, Westfield, both of N.J., assignors to GAF Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 955,483, Oct. 27, 1978, Ser. No. 942,644, Sep. 15, 1978, Pat. No. 4,153,446, Ser. No. 935,354, Aug. 21, 1978, Ser. No. 928,569, Jul. 27, 1978, and Ser. No. 892,146, Mar. 31, 1978. This application Dec. 14, 1978, Ser. No. 969,358
Int. Cl.[2] A01N *9/22*; C07D *207/26*
U.S. Cl. 260—326.5 S **21 Claims**

1. N-(N'-methylenepyrrolidonyl)-2-substituted aniline intermediate compounds having the formula:



where

R is alkyl, C_1–C_6, alkenyl, C_3–C_5, alkyleneoxyalkyl, $-(CH_2)_nOR''$, where n = 1–3, and R'' is alkyl, C_1–C_3, and cycloalkyl,

where n' = 0–3,

R' is hydrogen or alkyl, C_1–C_3, and,

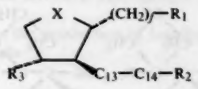
Y is oxygen or sulfur.

4,202,822
1-HYDROXYMETHYL-1-OXO-PROSTANE DERIVATIVES OF THE F_1 SERIES

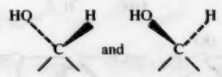
Allan Wissner, Ardsley, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

Filed Dec. 8, 1977, Ser. No. 858,589
Int. Cl.[2] C07D *317/10*
U.S. Cl. 260—340.9 P **190 Claims**

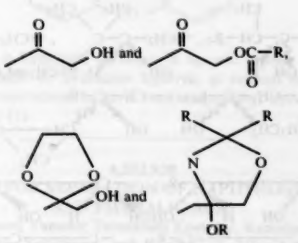
1. An optically active compound of the formula:



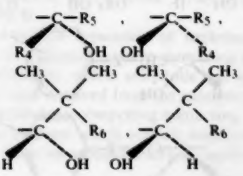
wherein X is a divalent moiety selected from the group consisting of:



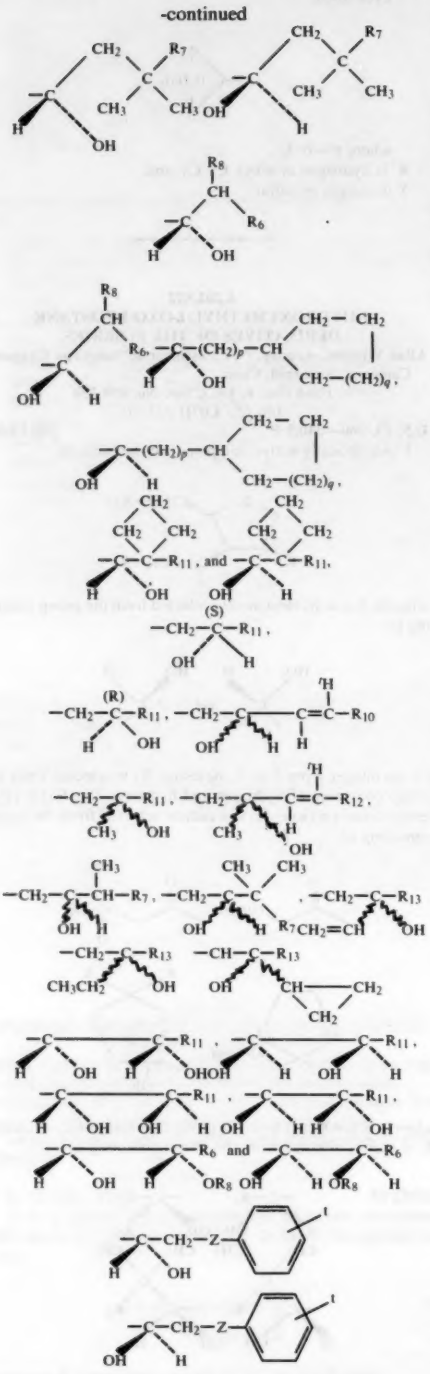
f is an integer from 5 to 7; inclusive; R_3 is selected from the group consisting of hydrogen and hydroxyl; C_{13}-C_{14} is ethyleneor trans-vinylene; R_1 is a radical selected from the group consisting of:



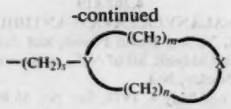
wherein R is selected from the group consisting of C_1–C_4 alkyl; R_2 is moiety selected from the group consisting of:



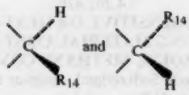
-continued



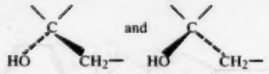
-continued



wherein R_4 is selected from the group consisting of hydrogen and methyl, R_5 is selected from the group consisting of C_4–C_7 alkyl, R_6 is selected from the group consisting of C_3–C_5 alkyl, R_7 is selected from the group consisting of C_2–C_4 alkyl, R_8 is selected from the group consisting of C_1–C_2 alkyl, p is an integer from 0 to 3, and q is 1 or 2, R_{10} is selected from the group consisting of C_1–C_4 alkyl, R_{11} is selected from the group consisting of C_3–C_7 alkyl, R_{12} is selected from the group consisting of C_1–C_4 alkyl, R_{13} is C_3–C_6 alkyl, X is a divalent radical selected from the group consisting of:



wherein R_{14} is selected from the group consisting of C_1–C_7 alkyl, hydrogen and a phenoxy group optionally substituted from the group consisting of halogen, trifluoromethyl and C_1–C_4 alkoxy, Y is a trivalent radical selected from the group consisting of:



Z is a divalent radical selected from the group consisting of —O—and —CH_2— -, m is zero or an integer from 1 to 4 inclusive, with the proviso that the sum of m and n has the value of 1 to 4, s is zero or the integer 1, t is selected from the group consisting of hydrogen, chloro, fluoro, dichloro, trifluoromethyl, methoxy and t-butyl; the racemic mixture thereof; and the mirror image thereof.

4,202,823

D-HOMOPREGNANES

Andor Fürst, Basel; Peter Keller, Reinach, and Marcel Müller, Frenkendorf, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

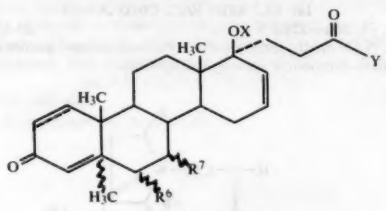
Filed Jun. 30, 1978, Ser. No. 921,036

Claims priority, application Luxembourg, Jul. 6, 1977, 77699

Int. Cl.[3] **C07D** *307/94;* **C07J** *63/00*

U.S. Cl. 260—343.6 **6 Claims**

1. A D-Homopregnane of the formula



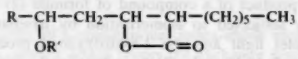
wherein X and Y taken together denote an oxygen to carbon bond; R^6 is hydrogen, R^7 is hydrogen, lower alkanoylthio or aroylthio, or R^6 and R^7 taken together denote a carbon to carbon bond and the dotted line in the 1,2-position of the A-ring together with the corresponding solid line denotes a single or double carbon to carbon bond.

4,202,824
PHYSIOLOGICALLY ACTIVE DERIVATIVES OF ESTERASTIN

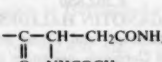
Hamao Umezawa, Tokyo; Takaaki Aoyagi, Fujisawa, and Tomio Takeuchi, Tokyo, all of Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Tokyo, Japan

Filed Apr. 26, 1979, Ser. No. 33,359
Claims priority, application Japan, May 25, 1978, 53-61725; May 25, 1978, 53-61726
Int. Cl.[2] C07D *305/12*
U.S. Cl. 260—343.9 4 Claims

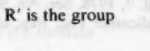
1. The compound having the formula



wherein R denotes a group of the formula CH_3—$(CH_2)_4$—CH=CH—CH_2—CH=CH—CH_2— or a group of the formula CH_3—$(CH_2)_{10}$— and R′ denotes a hydrogen atom or a group of the formula



provided that when R′ is the group



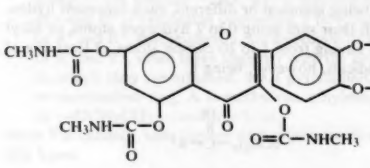
R is the group CH_3—$(CH_2)_{10}$—.

4,202,825
QUERCETIN PENTAMETHYL CARBAMATE AND A PROCESS FOR ITS PREPARATION

Miguel M. Tayà; Dionisio M. Aedo, and René Ricard, all of Barcelona, Spain, assignors to Rogador Sociedad Anonima, Esplugas de LLoebregat, Spain

Filed Mar. 7, 1978, Ser. No. 884,448
Claims priority, application Spain, Mar. 7, 1977, 456.574
Int. Cl.[2] C07D *311/04*
U.S. Cl. 260—345.2 1 Claim

1. Quercetin pentamethyl carbamate having the structural formula:



4,202,826
PROCESS FOR PREPARING ANHYDRIDE FROM ALKANES

Ralph O. Kerr, Houston, Tex., assignor to Denka Chemical Corporation, Houston, Tex.

Division of Ser. No. 767,499, Feb. 10, 1977, Pat. No. 4,105,586.
This application Apr. 21, 1978, Ser. No. 898,663
The portion of the term of this patent subsequent to Nov. 1, 1994, has been disclaimed.
Int. Cl.[2] C07D *307/60*
U.S. Cl. 260—346.75 10 Claims

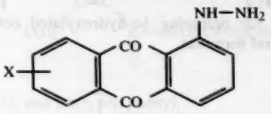
1. A process for the partial oxidation of C_4 to C_{10} hydrocarbons comprising contacting a feed comprising C_4 to C_{10} alkane hydrocarbons in vapor phase at elevated temperatures, with oxygen and a catalyst composition consisting of vanadium, phosphorus and oxygen and a modifying component of (a) Nb, Cu, Mo, Ni, Co and Cr, (b) one or more of the elements selected from the group consisting of Ce, Nd, Ba, Hf, U, Ru, Re, Li or Mg, and (c) one or more of the elements selected from the group consisting of Y, Sm, Tb, and Eu, wherein the atomic ratio of vanadium: phosphorus: Nb:Cu:Mo:Ni:Co:Ce:Nd:Cr:Ba:Hf:U:Ru:Re:Li:Mg:Y:Sm:Tb:Eu is 1:0.90 to 1.3: 0.001 to 0.125:0.022 to 0.201:0.0025 to 0.040:0.0022 to 0.045:0.004 to 0.066:0.0054 to 0.20:0.0022 to 0.20:0.0003 to 0.003:0.0023 to 0.0585:0.0023 to 0.0409:0.0033 to 0.0993:0.0002 to 0.02015:0.0002 to 0.0074:0.0072 to 0.179:0.0088 to 0.222:0.0001 to 0.02:0.0001 to 0.02:0.0001 to 0.02:0.0001 to 0.02, respectively, the total atomic ratio of Nb, Cu, Mo, Ni, Co, Ce, Nd, Cr, Ba, Hf, U, Ru, Re, Li, Mg, Y, Sm, Tb and Eu being in the range of 0.033 to 0.4.

4,202,827
PROCESS FOR THE PRODUCTION OF 1-ANTHRAQUINONYL HYDRAZINE

Athanassios Tzikas, Pratteln, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

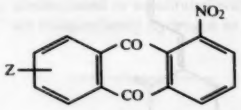
Filed Aug. 18, 1978, Ser. No. 935,035
Claims priority, application Switzerland, Sep. 2, 1977, 10735/77
Int. Cl.[2] C07C *109/04, 103/75*
U.S. Cl. 260—378 3 Claims

1. A process for the production of 1-anthraquinonyl hydrazines of the formula



(1),

wherein X is hydrogen or —NH—NH_2, which comprises reacting 1-nitroanthraquinones of the formula



(2),

wherein Z is hydrogen or nitro, in aprotic dipolar solvents, with hydrazine or hydrazine hydrate, at normal or slightly elevated temperature, to give 1-anthraquinonyl hydrazines of the formula (1).

4,202,828
PROCESS FOR SEPARATION OF NAPHTHOQUINONE AND PHTHALIC ACID

Ryo Matsuura, Yamato; Tatsuyoshi Komatsu, Kamakura; Yukio Nomiyama, Yokohama, and Kenji Usui, Nihonbashi, all of Japan, assignors to Kawasaki Kasei Chemicals Limited, Tokyo, Japan

Filed Jan. 10, 1978, Ser. No. 868,349
Int. Cl.[2] C07C *45/24, 49/66, 51/48, 63/16*
U.S. Cl. 260—396 R 9 Claims

1. A process for the separation of naphthoquinone and phthalic acid from a gaseous mixture containing naphthoquinone, phthalic anhydride, maleic anhydride and sulfuric anhydride or sulfuric acid obtained from the catalytic vapor phase oxidation of naphthalene comprising:contacting said mixture with an aqueous medium which collects naphthoquinone and phthalic anhydride as an aqueous slurry of napthoquinone and phthalic acid,

adding a base to said aqueous slurry to adjust the pH from

1.2 to 2.5 in order to neutralize only sulfuric acid and maleic acid in said slurry without substantially neutralizing phthalic acid present therein;

heating the aqueous slurry to a temperature of 60° C. to 100° C. to dissolve said phthalic acid thereby forming a slurry of naphthoquinone in an aqueous solution of phthalic acid; and

extracting naphthoquinone from said slurry with a solvent substantially immiscible with water while maintaining the temperature of the aqueous solution at a temperature sufficient to prevent crystallization of phthalic acid.

4,202,829

PROCESS FOR PREPARING 1α-HYDROXYLATED COMPOUNDS

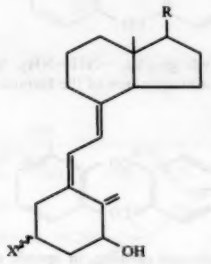
Hector F. DeLuca; Heinrich K. Schnoes; David E. Hamer, all of Madison, and Herbert E. Paaren, Verona, all of Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Continuation-in-part of Ser. No. 867,161, Jan. 5, 1978, abandoned. This application Dec. 13, 1978, Ser. No. 968,738

Int. Cl.² C07J *9/00*

U.S. Cl. 260—397.2 **11 Claims**

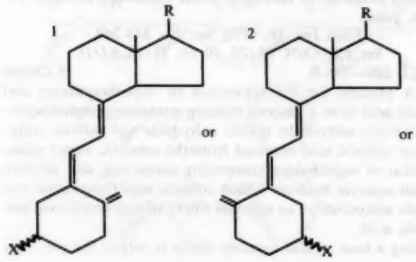
1. A method for preparing 1α-hydroxylated compounds having the general formulae



where R is selected from the group consisting of a substituted or unsubstituted cholesterol or ergosterol side chain group, and

X is selected from the group consisting of hydrogen, hydroxy, acyl, O-lower alkyl, O-lower acyl, and O-aromatic acyl,

which comprises subjecting compounds having the formulae



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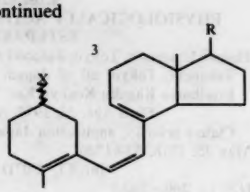


to allylic oxidation, with the proviso that the 1-hydroxylated product of a compound of formula (2) be subsequently subjected to isomerization by irradiation with ultraviolet light and the 1-hydroxylated product of a compound of formula (3) be subsequently subjected to thermal isomerization

and recovering the desired 1-hydroxylated product.

4,202,830

ORGANOTIN HALIDES

Helmut Korbanka, Adelsried, and Franz Scheidl, Gersthofen, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

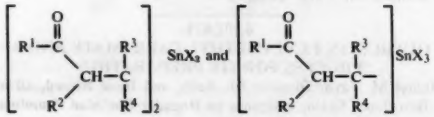
Filed Aug. 7, 1978, Ser. No. 931,678

Claims priority, application Fed. Rep. of Germany, Aug. 9, 1977, 2735757

Int. Cl.² C07F *7/22*

U.S. Cl. 260—429.7 **3 Claims**

1. Mixture of organotin halides of the formulae

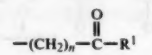


I II

in which

R^1 is OH, halogen, NH_2, an alkyl- or arylamino radical, an O-alkyl or O-aryl radical, both the latter radicals being unsubstituted or substituted by aryl or alkyl which may also carry as additional substituents halogen or hydroxy,

R^2 to R^4, being identical or different, each represent hydrogen with their sum being 0 to 2 hydrogen atoms, or alkyl radicals having from 1 to 20 carbon atoms; at least one of these radicals, however, being a



group where n is an integer of from 1 to 15;

X is chlorine, bromine or iodine,

and the radicals R^1 to R^4 and X corresponding to one another in the components I and II of the mixture are always identical.

4,202,831

PREPARATION OF SILANES

Ottfried Schlak, Leverkusen, and Hans-Heinrich Moretto, Cologne, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 26, 1979, Ser. No. 15,375

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1978, 2811854

Int. Cl.² C07F *7/18*

U.S. Cl. 556—467 **3 Claims**

1. A process for the preparation of a silane of the formula

$R_aSiH_b(OR')_{4-(a+b)}$

wherein

R is optionally subsituted alkyl, alkenyl or aryl with up to 7 C atoms,

R' is alkyl with 1 to 4 C atoms,

a and b each independently is 1, 2 or 3, and

a+b is at most 4,

comprising reacting an Si-H polysiloxane with a compound of the formula

$R_aSi(OR')_{4-a}$

in the presence of a conventional redox-stable siloxane polymerization catalyst which favors the exchange reaction.

4,202,832

THIOCARBAMOYLTHIO FATTY ACIDS

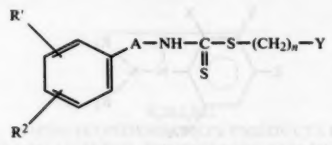
Ulf Fischer, Frenkendorf, and Ado Kaiser, Lausen, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 792,630, May 2, 1977, abandoned. This application Oct. 20, 1978, Ser. No. 953,720

Int. Cl.[2] C07C *155/08;* C07D *207/12, 211/30, 295/18*

U.S. Cl. 260—455 A 5 Claims

1. A compound of the formula



I

wherein R^1 is hydrogen, and R^2 is halogen; Y is a group of the formula

wherein

R^3 is hydroxy, lower alkoxy, hydroxy-(lower alkoxy) or a group of the formula $—N(R^4)(R^5)$, wherein R^4 is hydrogen and R^5 is cycloalkyl containing 3 to 6 carbon atoms, or R^4 and R^5, independently, are hydrogen or lower alkyl, or R^4 and R^5, when taken together with the nitrogen atom to which they are attached, are a pyrrolidino, piperidino or morpholino ring; A is methylene, ethylene, propylene or $—OCH_2CH_2—$; and n is 3, or,

when Y is carboxy, salts thereof with pharmaceutically acceptable bases.

4,202,833

HYDROPEROXYISOPROPYLPHENYL CARBONATES

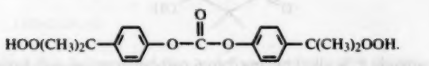
Sheng-Hong A. Dai, Wallingford, Conn., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 879,788, Feb. 21, 1978, Pat. No. 4,164,510, which is a continuation-in-part of Ser. No. 818,233, Jul. 22, 1977, abandoned. This application May 11, 1979, Ser. No. 38,133

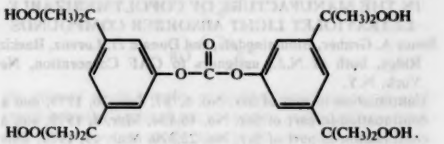
Int. Cl.[2] C07C *69/00*

U.S. Cl. 260—463 2 Claims

1. A dihydroperoxide having the formula



2. A tetrahydroperoxide having the formula



4,202,834

COPOLYMERIZABLE, ULTRAVIOLET LIGHT ABSORBER (2-CYANO-3,3-DIPHENYLACRYLOXY) ALKYLENE ETHYLENIC ETHERS

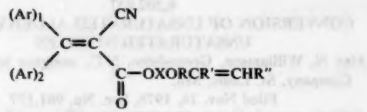
Bruce A. Gruber, Bloomingdale, and Donald H. Lorenz, Basking Ridge, both of N.J., assignors to GAF Corporation, New York, N.Y.

Filed Mar. 20, 1979, Ser. No. 22,370

Int. Cl.[2] C07C *21/70*

U.S. Cl. 260—465 D 10 Claims

1. Copolymerizable ultraviolet light absorber compounds having the formula:



where $(Ar)_1$ and $(Ar)_2$ are phenyl;

X is alkylene, C_2–C_{17}, unsubstituted or substituted with halo, cyano, alkyl, alkoxy, alkoxyalkyl, or alkoxyalkyleneoxy, C_1–C_6; and,

R is alkylene, oxyalkylene, alkyleneoxyalkylene, benzylene, C_1–C_{10}, unsubstituted or substituted with hydroxy; and

R' and R'' are independently hydrogen or alkyl, C_1–C_6.

4,202,835

PREPARATION OF α-CYANO-3-PHENOXY-BENZYL ALCOHOL

Jacques Prost-Marechal, Paris, and Jean Tessier, Vincennes, both of France, assignors to Roussel Uclaf, Paris, France

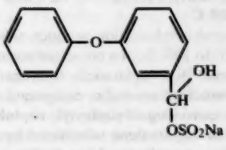
Continuation of Ser. No. 820,097, Jul. 29, 1977, abandoned. This application Apr. 11, 1979, Ser. No. 28,994

Claims priority, application France, Aug. 27, 1976, 76 25938

Int. Cl.[2] C07C *121/75*

U.S. Cl. 260—465 F 11 Claims

1. A process for the preparation of α-cyano-3-phenoxy-benzyl alcohol comprising reacting a compound capable of generating CN^- ions and a m-phenoxy-benzaldehyde bisulfite of the formula



in the presence of at least one aprotic dipolar organic solvent.

4,202,836

ACETOXYALKYL CYANOACETATE INTERMEDIATES IN THE MANUFACTURE OF COPOLYMERIZABLE, ULTRAVIOLET LIGHT ABSORBER COMPOUNDS

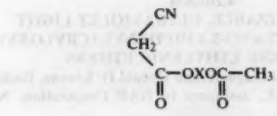
Bruce A. Gruber, Bloomingdale, and Donald H. Lorenz, Basking Ridge, both of N.J., assignors to GAF Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 6,787, Jan. 26, 1979, and a continuation-in-part of Ser. No. 16,134, Mar. 1, 1979, and a continuation-in-part of Ser. No. 22,320, Mar. 19, 1979. This application Apr. 17, 1979, Ser. No. 30,753

Int. Cl.[2] C07C *121/00, 121/20*

U.S. Cl. 260—465.4 5 Claims

1. Acetoxyalkyl cyanoacetate compounds having the formula:



where X is alkylene, C_2–C_{17}, unsubstituted or substituted with halo, cyano, alkyl, C_1–C_6, alkoxy, C_1–C_6, alkoxyalkyl, C_1–C_6, or alkoxyalkyleneoxy, C_1–C_6.

4,202,837

CONVERSION OF UNSATURATED ALDEHYDES TO UNSATURATED NITRILES

Alex N. Williamson, Greensboro, N.C., assignor to Monsanto Company, St. Louis, Mo.

Filed Nov. 16, 1978, Ser. No. 961,177

Int. Cl.[2] C07C *120/00*

U.S. Cl. 260—465.9 7 Claims

1. A process for ammoxidation of an olefinically unsaturated aldehyde selected from acrolein and methacrolein to the corresponding unsaturated nitrile in the liquid phase comprising the steps of

(a) forming a complex of a copper salt with ammonia wherein the molar ratio of copper salt to ammonia is from 1:10 to 10:1 in a solvent by contacting said copper salt with ammonia, and

(b) contacting the complex with the unsaturated aldehyde in the presence of molecular oxygen in the substantial absence of free ammonia.

4,202,838

SULPHONATED CONDENSATION PRODUCTS

Alain Lauton, St. Louis, France; Roland Putzar, Therwil, Switzerland; Hans-Ulrich Berendt, Allschwil, Switzerland, and Gustaaf Scherer, Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

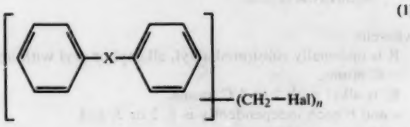
Continuation of Ser. No. 736,643, Oct. 29, 1976, abandoned, which is a continuation of Ser. No. 659,388, Feb. 19, 1976, abandoned, which is a continuation of Ser. No. 410,749, Oct. 29, 1973, abandoned. This application Jun. 29, 1978, Ser. No. 920,589

Claims priority, application Switzerland, Nov. 3, 1972, 16042/72

Int. Cl.[2] C07C *143/24, 143/42;* C09B *67/00*

U.S. Cl. 260—505 C 11 Claims

1. A sulphonated condensation product, which is obtained, by reaction at 40° to 160° C. of a binuclear aromatic compound containing at least two replaceable hydrogen atoms in the nucleus, said binuclear aromatic compound being selected from the group consisting of diphenyl, naphthalene, tetrahydronaphthalene or naphthalene substituted by hydroxy, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms or halogen, with a compound of the formula



(1)

wherein X represents the direct bond or oxygen, Hal represents chlorine or bromine and n is a number from 1 to 4 and sulphonation with sulphuric acid, chlorosulphonic acid or oleum at 20° to 200° C.

4,202,839

NITROPHENYLHYDRAZINE COMPOUNDS

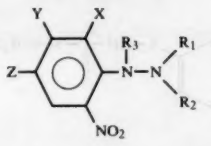
Don L. Hunter, Anaheim; William G. Woods, Fullerton; James D. Stone, Whittier, all of Calif., and Cecil W. LeFevre, Franklin, Id., assignors to United States Borax & Chemical Corporation, Los Angeles, Calif.

Division of Ser. No. 529,655, Dec. 4, 1974, abandoned. This application Dec. 26, 1978, Ser. No. 973,289

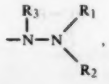
Int. Cl.[2] C07C *109/04*

U.S. Cl. 260—569 11 Claims

1. A compound of the formula



wherein X is selected from hydrogen and nitro, Y is selected from lower alkoxy, amino, alkylamino, dialkylamino and



Z is selected from halo and trifluoromethyl, R_1 is lower alkyl, and R_2 and R_3 are each selected from hydrogen and lower alkyl, with the proviso that when X is nitro, Y is lower alkoxy.

4,202,840

1-HYDROXY-2-(ALKYLKETO)-4,4,6,6-TETRAMETHYL CYCLOHEXEN-3,5-DIONES

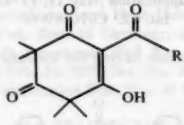
Reed A. Gray, Saratoga; Chien K. Tseng, El Cerrito, and Ronald J. Rusay, Lafayette, all of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Sep. 29, 1978, Ser. No. 947,217

Int. Cl.[2] C07C *49/44*

U.S. Cl. 260—438.1 6 Claims

1. A compound having the following structural formula



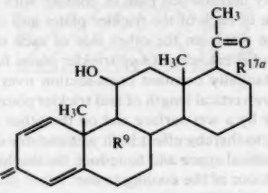
wherein R is alkyl having 2 to 6 carbon atoms, except isopropyl and isobutyl.

4,202,841
D-HOMOPREGNANES

Leo Alig, Kaiseraugst; Andor Fürst, Basel; Marcel Müller, Frenkendorf, all of Switzerland; Ulrich Kerb, Berlin, Fed. Rep. of Germany; Klaus Kieslich, Berlin, Fed. Rep. of Germany, and Rudolf Wiechert, Berlin, Fed. Rep. of Germany, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 827,758, Aug. 25, 1977, abandoned. This application Dec. 26, 1978, Ser. No. 973,336
Int. Cl.[2] C07C *49/00*; C07J *63/00*
U.S. Cl. 424—311 10 Claims

1. A D-homopregnane of the formula



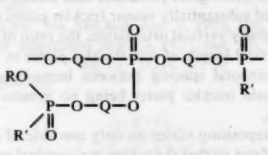
wherein R^9 is hydrogen or fluoro; and R^{17a} is alkanoyloxy of 1 to 7 carbon atoms with the proviso that the C-11 hydroxy group is β-oriented when R^9 is hydrogen.

4,202,842
COPOLYCONDENSATION PRODUCTS OF BETA-HALOALKYL PHOSPHATES AND DIALKYL PHOSPHONATES

Edward D. Weil, Hastings-on-Hudson, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 858,316, Dec. 7, 1977, Pat. No. 4,152,371, which is a division of Ser. No. 811,972, Jul. 5, 1977, Pat. No. 4,086,303, which is a continuation-in-part of Ser. No. 783,995, Apr. 4, 1977, abandoned, which is a continuation-in-part of Ser. No. 558,862, Mar. 17, 1975, abandoned, which is a continuation-in-part of Ser. No. 410,583, Nov. 12, 1973, abandoned. This application Jan. 2, 1979, Ser. No. 230
Int. Cl.[2] C07G *9/09*
U.S. Cl. 260—928 10 Claims

1. A copolycondensation product of a tris(β-haloalkyl) phosphate and a dialkyl phosphonate consisting essentially of a polymer having repeating units of the structure



in which Q is alkylene of from 2 to 4 carbon atoms, R is alkyl of from 1 to 4 carbon atoms and R′ is alkyl of from 1 to 20 carbon atoms, alkenyl of from 3 to 20 carbon atoms, or phenyl optionally substituted with alkyl of from 1 to 4 carbon atoms, said polycondensation product obtained by the steps of (1) heating in the presence of a nucleophilic catalyst a tris(β-haloalkyl) phosphate of the formula

$$(XQO)_3P{=}O$$

in which X is halogen and Q is as defined herein, with a dialkyl phosphonate of the formula

in the ratio of about 2 moles of dialkyl phosphonate per mole of tris(β-haloalkyl) phosphate, to obtain a crude polycondensation product having acidic structures, and (2) substantially neutralizing said acidic structures by heating the crude product with an epoxide or an orthoester.

4,202,843
PROCESS FOR THE PRODUCTION OF ORGANIC PHOSPHATES BY NITRIC ACID OXIDATION OF ORGANIC PHOSPHITES

Eugene P. Di Bella, Piscataway, N.J., assignor to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Filed Aug. 2, 1978, Ser. No. 930,446
Int. Cl.[2] C07F *9/09*
U.S. Cl. 260—985 7 Claims

1. The process for the production of organic phosphates that comprises adding to an organic phosphite having the structural formula

wherein R^1, R^2, and R^3 each represents an alkyl group having 1 to 20 carbon atoms, an aryl group having 6 to 20 carbon atoms, an aralkyl group having 7 to 20 carbon atoms, or an alkaryl group having 7 to 20 carbon atoms and the total number of carbon atoms in R^1, R^2, and R^3 is at least 12, 10% to 70% nitric acid in the amount of at least 0.40 mole of nitric acid per mole of phosphite at a temperature in the range of 0° to 60° C.

4,202,844
PROCESS FOR THE PRODUCTION OF ORGANIC PHOSPHATES

Eugene P. Di Bella, Piscataway, N.J., assignor to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Filed Aug. 2, 1978, Ser. No. 930,445
Int. Cl.[2] C07F *9/09*
U.S. Cl. 260—985 9 Claims

1. The process for the production of organic phosphates that comprises contacting an organic phosphite having the structural formula

wherein R^1, R^2, and R^3 each represents an alkyl or haloalkyl group having 1 to 18 carbon atoms, an alkoxyalkyl group having 2 to 18 carbon atoms, an aryl or haloaryl group having 6 to 18 carbon atoms, or an alkoxyaryl, alkaryl, or aralkyl group having 7 to 18 carbon atoms with an amount of an oxygen-containing gas that will provide at least 0.40 mole of oxygen per mole of said phosphite in the presence of an amount of a nitrogen dioxide catalyst that will provide 0.01 mole to 0.25 mole of nitrogen dioxide per mole of said phosphite at a temperature in the range of −30° C. to 100° C.

4,202,845

SULFUR VULCANIZABLE ETHYLENE-VINYL ACETATE COPOLYMER ELASTOMERS

Eugene Y. C. Chang, Bridgewater, and Robert Saxon, Princeton, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Nov. 20, 1978, Ser. No. 962,414
Int. Cl.[2] C08F 255/02
U.S. Cl. 525—302 15 Claims

1. A sulfur vulcanizable elastomer composition comprising:

(A) from about 20 to 80 percent by weight of a copolymer of about 50 to 92 percent ethylene and 8 to 50 percent vinyl acetate, and grafted thereon

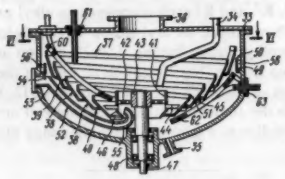
(B) about 80 to 20 percent by weight of a mixture of a major proportion of one or more C_2–C_8 alkyl monoesters of acrylic acid and a minor proportion of an ethylenically unsaturated comonomer containing a cure-site for sulfur vulcanization.

4,202,846

ROTOR FILM APPARATUS FOR PROCESSES WITH PARTICIPATION OF LIQUID AND GAS

Alexandr V. Shafranovsky, Balashikha, Molodezhnaya ulitsa, 4, kv. 7, Moskovskaya; Viktor M. Olevsky, Leningradsky prospekt, 75[a], kv. 91, Moscow; Vladimir K. Chubukov, Komsomolsky prospekt, 41, kv. 97, Moscow; Jury A. Baskov, shosse Entuziastov, 156, kv. 20, Moscow, and Konstantin V. Dmitriev, Sovetsky prospekt 87 kv. 29, Kemerovo, all of U.S.S.R.

Filed Oct. 4, 1978, Ser. No. 948,991
Int. Cl.[2] B01F 3/04
U.S. Cl. 261—142 28 Claims



1. A rotor film apparatus for processes with participation of liquid and gas comprising: a casing; at least one refluxing stage mounted in said casing with a provision for rotating around its own axis; at least one trough forming said refluxing stage and curved into a spiral which uncoils from the axis of the refluxing stage and has a gap between its loops for the passage of gas; said trough whose hollow is located at the concave side of said spiral and intended to create a liquid film; portions of said trough gradually departing from the axis of said refluxing stage are displaced in one direction parallel to said axis so that said refluxing stage is shaped like a bowl; an appliance mounted on said casing for delivering liquid to said refluxing stage.

4,202,847

APPARATUS AND METHOD FOR COOLING COOLING WATER ESPECIALLY IN COOLING TOWERS

Gunter Ernst, Strasse des Roten Kreuzes, D-7500 Karlsruhe, Fed. Rep. of Germany; Edmund Baer, Karlsruhe, and Dieter Wurz, Pfinztal, both of Fed. Rep. of Germany, assignors to Gunter Ernst, Karlsruhe, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 706,301, Jul. 19, 1976, abandoned. This application Aug. 4, 1978, Ser. No. 931,001
Claims priority, application Fed. Rep. of Germany, Jul. 21, 1975, 2532544
Int. Cl.[2] B01F 3/04
U.S. Cl. 261—161 28 Claims

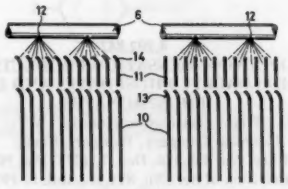
1. A method of achieving both a wet cooling and a dry cooling effect in the same vertical space of a cooling tower comprising the steps of:

(a) providing a plurality of spaced apart substantially vertical trickler plates, the ratio of the vertical height of said plates to the spacing between immediately adjacent plates being no greater than about 50:1;

(b) depositing water to be cooled on only one side of each of the plurality of trickler plates at a rate to produce a substantially undisturbed thin film of water down that side of each of the plurality of trickler plates; and,

(c) passing air up along both sides of each of the plurality of trickler plates as a result of natural draught along a substantially undisturbed path in contact with the water on one side of each of the trickler plates and out of contact with the water on the other side of each of the trickler plates, adjacent ones of said trickler plates forming a duct of substantially constant cross-section over substantially the entire vertical length of said trickler plates bounded on one side by a wet surface and on the other side by a dry surface, to thereby effect both wet and dry cooling in the same vertical space and to reduce the discharge of water particles out of the cooling tower.

4. In a water cooling tower having an aperture at both the upper and lower end thereof, open to the atmosphere respectively for the entrance of air into the tower and for the exit thereof from the tower at a velocity substantially that created by natural draught, having means for introducing water to be cooled and for collecting the cooled water, and having both



wet cooling and dry cooling of the water as it traverses the tower under the influence of gravity, means for accomplishing both wet and dry cooling of the water in the same vertical space with reduced discharge of water particles out of the cooling tower as a result of disturbance of the air path upward through the cooling tower and the water path down through the cooling tower to thereby reduce the generation of vapor clouds and bacteriological pollution, said means comprising:

a plurality of substantially planar trickler plates each having a substantially vertical orientation, the ratio of the substantially vertical length of said trickler plates to the substantially horizontal spacing between immediately adjacent ones of said trickler plates being no greater than about 50:1; and,

means for depositing water on only one side of each of said trickler plates so that the substantial vertical orientation of said trickler plates permits a substantially undisturbed low speed film flow of water on the wet surface of each of said trickler plates and permits a substantially undisturbed low speed flow of air on the dry side of each of said trickler plates, adjacent ones of said trickler plates forming a duct of substantially constant cross-section over substantially the entire vertical length of said trickler plates bounded on one side by a wet surface and on the other side by a dry surface,

whereby the air transiting each of the ducts thus formed is substantially undisturbed and the generation of vapor clouds and bacteriological pollution reduced.

4,202,848

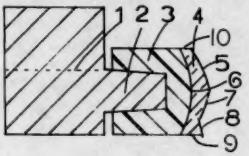
METHOD OF MAKING BIFOCAL CONTACT LENSES

Charles W. Neefe, Box 429, Big Spring, Tex. 79720

Continuation-in-part of Ser. No. 874,934, Feb. 3, 1978, Pat. No. 4,150,073, which is a continuation-in-part of Ser. No. 793,388, May 25, 1977, abandoned. This application Dec. 22, 1978, Ser. No. 972,526

Int. Cl.[2] B29D *11/00*; B29C *17/10*

U.S. Cl. 264—1 2 Claims



1. A method of making bifocal contact lenses by the steps of providing a positive lens mold having a surface curvature corresponding to the curve required on the concave surface of the finished lens, producing a negative mold from said positive mold by applying heat and pressure to a resinous material, said resinous material being softened by heating and conforming by applied pressure to the shape and curvature for said positive mold to provide a negative resinous mold from said positive mold, providing an open top cylinder formed by the sides of the resinous mold extending upward above the negative optical curve, filling said resinous cylinder and covering said optical curve with a liquid monomer lens material which is polymerized to form a solid monolithic mass within said resinous container having one finished optical surface molded against the optical surface present on the bottom of said resinous cylinder, cutting and polishing a convex optical surface on the polymerized solid lens material by providing for the eccentric rotation of the resinous contact lens blank, eccentrically cutting a first convex radius on the resinous lens, the lens having thick and thin opposing edges, the thick edge being positioned toward the center of rotation and the thin edge positioned away from the center of rotation, repositioning the lens whereby the thin edge is toward the center of rotation and the thick edge is away from the center of rotation, cutting a second convex optical surface having a shorter radius than the first convex surface and a size smaller than the first convex surface, removing the lens from the resinous mold.

4,202,849

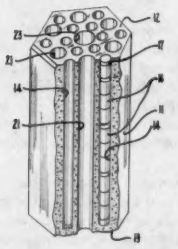
METHOD FOR MAKING NUCLEAR FUEL ELEMENT

Gary N. Miertschin, San Diego, and Kenneth F. Powell, Cardiff, both of Calif., assignors to General Atomic Company, San Diego, Calif.

Division of Ser. No. 565,868, Apr. 7, 1975, Pat. No. 4,060,454. This application Sep. 12, 1977, Ser. No. 832,389

Int. Cl.[2] G21C *21/00*

U.S. Cl. 264—0.5 3 Claims



1. A method for making a nuclear fuel element comprised of a graphite block having a plurality of elongated holes therein extending from one surface to terminate spaced from an opposite substantially parallel surface and having nuclear fuel rod segments in said holes, said segments being comprised of nuclear fuel in a matrix material, said method comprising inserting a plurality of unfired fuel rod segments in each of said holes and spacing at least some of said segments axially along said holes from each other by spacers, the total of the distances the rod segments are spaced being at least sufficient to accommodate shrinkage of the block due to irradiation, closing each of said holes with a plug, and firing the fuel element, said spacers being of a material which gasifies at the firing temperature to leave empty the spaces between the spaced fuel rod segments, and wherein a suitable clearance is provided between each of the fuel rod segments and the wall of the holes in which it is inserted sufficient to allow bleeding of fuel rod matrix into the space during firing, such that said fuel rod segments are held in place in the spaced relationship after firing, but are permitted to slide to accommodate differential shrinkage.

4,202,850

PROCESS FOR PRODUCING FIBER-REINFORCED ELASTIC ARTICLES

Shinji Yamamoto; Kouhei Kaijiri, and Denichi Oda, all of Ichihara, Japan, assignors to Ube Industries, Ltd., Ube, Japan

Filed Mar. 29, 1978, Ser. No. 891,462

Claims priority, application Japan, Apr. 12, 1977, 52/40903; Jul. 11, 1977, 52/81957

Int. Cl.[2] B29D *3/02*

U.S. Cl. 264—108 14 Claims

1. A process for producing a fiber-reinforced elastic article, which comprises the steps of:

kneading a mixture of a rubber material capable of being vulcanized and powdered 1,2-polybutadiene in an amount of 1 to 200 parts by weight per 100 parts by weight of said rubber material, at a temperature lower than the melting point of said 1,2-polybutadiene, to disperse the particles of said 1,2-polybutadiene in the matrix of said rubber material, said 1,2-polybutadiene containing 80% or more of 1,2-structure;

extruding said dispersion through a die at a temperature of at least 5° C. above the melting point of said 1,2-polybutadiene but not higher than 240° C. to provide a strand or tape of said dispersion in which said dispersed 1,2-polybutadiene is in the form of fibrils;

rolling said extruded dispersion by means of a pair of rollers to provide a tape or sheet of said dispersion and to cause the 1,2-polybutadiene fibrils to have an increased degree of molecular orientation, said resultant rolled dispersion tape or sheet having a thickness of 0.02 mm or more and not exceeding one-half of the thickness of said extruded dispersion strand or tape;

providing a composition, (A) when the content of said 1,2-polybutadiene in said rolled dispersion is 1 to 20 parts by weight per 100 parts by weight of said rubber material, by admixing said rolled dispersion with a vulcanizing agent or (B) when the content of said 1,2-polybutadiene in said rolled dispersion is more than 1 part by weight but not more than 200 parts by weight per 100 parts by weight of said rubber material, by admixing said rolled dispersion with a vulcanizing agent and an additional rubber material capable of being vulcanized, said additional rubber material being in an amount enough for adjusting the content of said 1,2-polybutadiene in the resultant composition to a level of from 1 to 20 parts by weight per 100 parts by weight of the sum of said rubber material and said additional rubber material, and;

shaping and vulcanizing said composition to provide a shaped, vulcanized elastic article.

4,202,851

METHOD OF PREPARING A SHEET-FORMED PRODUCT

Karl K. K. Kroyer, Engtoften 3, DK-8260 Viby J., Denmark

Filed Jun. 8, 1977, Ser. No. 804,821

Claims priority, application Denmark, Jun. 18, 1976, 2729/76; Jul. 12, 1976, 3145/76

Int. Cl.[2] B29J 5/00

U.S. Cl. 264—113 17 Claims

1. A method of preparing a fire-resistant sheet-formed product which comprises the steps of:

(a) grinding together and forming a uniform dry mixture

(i) a particulate inorganic material selected from the group consisting of crystallized blistered glass, crushed cement clinkers and crushed blast-furnace slags;

(ii) a hydraulic binder; and

(iii) from 10 to 20% by weight of an organic thermosetting binder;

the grinding and mixing together being effected in a ball mill until the particulate inorganic material has sufficiently disintegrated and the particulate inorganic material, the hydraulic binder, and the organic thermosetting binder are homogeneously distributed to form a dry mixture of particles;

(b) placing the dry mixture of particles formed during step (a) into a mold, closing the mold, hot pressing said material in said mold to bring about a setting of the organic binder, thereby consolidating and bonding the dry particles into a unitary structure to form a self-supporting sheet; and

(c) after release of pressure, opening the mold, removing said self-supporting sheet, and treating said sheet with water to set and cure the hydraulic binder to form said fire-resistant sheet-formed product.

4,202,852

PROCESS FOR PRODUCING COLORED NONWOVEN FIBROUS WEBS

Walter L. Pauls, Appleton, and Fredric N. Miller, Menasha, both of Wis., assignors to American Can Company, Greenwich, Conn.

Continuation of Ser. No. 774,665, Mar. 4, 1977, abandoned. This application Oct. 13, 1978, Ser. No. 951,441

Int. Cl.[2] D06P 7/00; D06M 11/16; B32B 23/14

U.S. Cl. 264—115 3 Claims

1. A process for producing a colored non-woven air laid fibrous web, comprising the steps of:

(a) providing a pulp web formed of a compacted mass of individual pulp fibers;

(b) applying to only a portion of the pulp web a water suspension of non-toxic water-insoluble color pigment particles having a size range of 0.1 to 0.5 microns to thereby apply an adherent coating of said pigment particles to a portion of the pulp fibers in said web while leaving a portion of said fibers uncoated;

(c) heating said pigmented web to reduce the water content thereof to less than approximately 15% of the dry weight of the material in the web;

(d) feeding said dry pigmented web into a fiberizer to break down said web into individual pulp fibers and to uniformly mix the pigment-coated fibers with the non-coated fibers to produce a substantially uniformly colored fiber mixture;

(e) air laying the uniformly colored fiber mixture to form a uniformly colored web;

(f) applying a water insoluble liquid polymer binder material onto both sides of the web and through the web; and

(g) curing the binder material to bind the fibers together and firmly bond the pigment particles onto the coated fibers of the web to form a bleed resistant and run resistant uniformly colored air laid web.

4,202,853

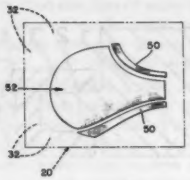
METHOD FOR CONSTRUCTING BREAST CUPS

Flavia DiTullio, New York, N.Y., assignor to Hanes Corporation, Winston-Salem, N.C.

Filed Sep. 6, 1977, Ser. No. 830,398

Int. Cl.[2] B29C 17/08, 17/03; B29D 31/00

U.S. Cl. 264—138 4 Claims



1. The method of forming a breast receiving cup unit for a brassiere or other garment comprising the steps of: positioning a basically flat sheet of flexible fabric formed at least partially of thermoplastic yarns within a breast cup mold having a prescribed peripheral contour; heat-setting selected portions of the flexible fabric sheet and forming a three dimensional molded fabric surface defining a breast cup having the peripheral contour of the mold and having an endless marginal edge conforming to the base of the mold, and unmolded fabric sections surrounding the endless marginal edge of the molded breast cup; aligning a cutting die, having an endless outer peripheral cutting edge conforming in size and configuration to the endless marginal edge of the three dimensional heat-set breast cup, with the marginal edge of the breast cup, displacing the endless outer peripheral cutting edge of the cutting die to clamp the breast cup marginal edge to prevent wrinkling of the three dimensional molded fabric and to cut the fabric along the marginal edge of the breast cup to remove unmolded portions of the flexible sheet outwardly of the breast cup marginal edge, while simultaneously altering the endless marginal edge of the breast cup to form a modified three dimensional cup differing in shape, cut and configuration from the configuration of the breast cup as initially molded with the fabric surface area of the modified three dimensional breast cup being less than the surface area of the breast cup as initially molded by cutting away selected areas of the flexible, molded, three dimensional surface areas of the initially molded cup inwardly of the marginal edge of the cup as initially molded to define a new marginal edge having portions contiguous with the marginal edge of the cup as initially molded.

4,202,854

POLYAMIDE SPIN-TEXTURE PROCESS

Paul T. Howse, Jr., Pensacola, and Arnold E. Wilkie, Pensacola Beach, both of Fla., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 23, 1977, Ser. No. 864,127

Int. Cl.[2] D01D 5/22

U.S. Cl. 264—168 15 Claims

1. A process for continuously melt spinning and drawing multifilament polyamide yarn whereby latent crimp is imparted to the yarn during the drawing thereof without the use of special crimping equipment, comprising:

(a) extruding molten fiber-forming polyamide through orifices of a spinneret to form a plurality of molten streams,

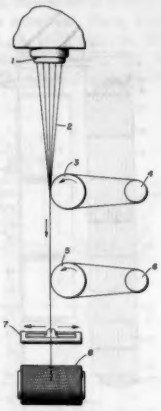
(b) cooling the molten streams in a quenching zone to form solid filaments,

(c) heating said filaments by passing the filaments from said quenching zone with a given number of wraps around a first roll arrangement rotating at a given peripheral speed and having at least one roll maintained at a temperature of at least 70° C. but less than that temperature at which deterioration of the filaments occur,

(d) drawing said filaments by passing the filaments from said

first roll arrangement with a plurality of wraps around a second roll arrangement rotating at a peripheral speed such that the filaments are drawn between said first and second roll arrangements at a draw ratio ranging from greater than 1.0 to less than 4.0, wherein said drawing is accomplished before the filaments reach equilibrium crystallization and,

(e) collecting said filaments in the form of a yarn,



said process being characterized in that said temperature, said number of wraps taken around said first roll arrangement and said draw ratio are correlated to provide a yarn having at least 10% crimp as determined by the formula % crimp=$(L_3-L_2/L_3)\times 100$ where L_2 and L_3 represent the length of a sample of said yarn after the sample has been exposed to 180° C. dry heat for 5 minutes followed by cooling for 1 minute, first measured stressed at 0.0009 grams per denier (L_2) and then measured stressed at 0.8 grams per denier (L_3).

4,202,855

METHOD OF PRODUCING CONTINUOUS MULTIFILAMENT YARNS

Lüder Gerking; Dirk Stahlmann; Horst Rothert, and Wolf Karasiak, all of Berlin, Fed. Rep. of Germany, assignors to Karl Fischer, Apparate-und Rohrleitungsbau, Berlin, Fed. Rep. of Germany

Filed Apr. 25, 1977, Ser. No. 790,742

Claims priority, application Fed. Rep. of Germany, Apr. 23, 1976, 2618406

Int. Cl.[2] D01D *5/12*

U.S. Cl. 264—210.2 **12 Claims**

1. In a method for producing a multifilament bundle of a plurality of continuous individual filaments of thermoplastic polymers by extruding the polymer in molten form into individual filaments, subjecting the filaments to a removal force to withdraw them from the extrusion location while subjecting the filaments to the steps of preorienting and solidifying the extruded filaments, combining the solidified filaments into a bundle, subjecting the resulting bundle to a preparation treatment, and conducting the bundle, subsequent to the preparation treatment, to a collecting location at which the removal force is applied, the improvement comprising causing a stream of gas flowing in a direction having a component parallel to the length, and extending in the direction of travel, of the filaments to contact the filaments subsequent to solidfication thereof in a region where the filaments are subject to the removal force for subjecting the filaments to a further force in the direction of their length, which further force determines the tension imposed on the filaments during the step of preorienting.

4,202,856

GRAPHITE-EPOXY MOLDING METHOD

Bert R. Frikken, Depew, and Ronald G. Halcomb, Tulsa, both of Okla., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Sep. 30, 1977, Ser. No. 838,191

Int. Cl.[2] B29G *5/00*; B29C *17/06*

U.S. Cl. 264—221 **3 Claims**

1. A method of forming a fiber reinforced thermosetting resin composite structural part having a hollow configuration comprising the following steps in the sequence set forth:

(a) providing a hollow, rigid, frangible mandrel having an exterior configuration substantially similar to but sized smaller than the configuration and size of said structural part;

(b) forming a flexible pressure bag on said rigid hollow mandrel, said pressure bag having an interior configuration corresponding to said mandrel exterior configuration and having an exterior configuration substantially similar and sized the same as the interior configuration of said composite structural part;

(c) assembling plies of fiber reinforced thermosetting resin material on said pressure bag;

(d) fracturing and removing at least a portion of said hollow, rigid, frangible mandrel from within said pressure bag;

(e) enclosing any remaining portion of said hollow mandrel, said pressure bag, and said assembled plies of fiber reinforced resin material in a split mold having a molding surface with a configuration corresponding to the exterior configuration of said structural part; and

(f) curing said fiber reinforced thermosetting resin material plies in said split mold at an elevated resin curing temperature and with an internal pressure within said pressure bag significantly greater than ambient pressure.

4,202,857

CASTING OF ARTICLES FROM COMPOSITIONS CONTAINING CALCINED GYPSUM AND PORTLAND CEMENT

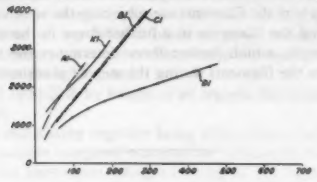
James N. Lowe, Reigate, England, assignor to Pitun-Unicrete Limited, Reigate, England

Filed Jul. 18, 1978, Ser. No. 925,670

Claims priority, application United Kingdom, Jul. 19, 1977, 30276/77

Int. Cl.[2] B28B *1/14*

U.S. Cl. 264—333 12 Claims



1. In a method of casting an article comprising the steps of mixing a composition comprising an hydraulic binding agent consisting essentially of, by weight, from 90% to 10% calcined gypsum, from 10% to 90% Portland cement and from 0% to 15% Pozzalana cement with water to produce a fluid mixture, causing said fluid mixture to flow into a supporting device, and allowing said mixture to set in said supporting device, the improvement wherein said composition further contains sodium carbonate in an amount of from about 0.1% to about 5% by weight of the dry weight of said cement in said composition, said sodium carbonate reducing local expansion or general expansion of said mixture with a consequent loss in compressive strength upon setting said mixture.

4,202,858

MOSS KILLER

Gary Bruce, c/o George Spector 3615 Woolworth Bldg. 233 Broadway, and George Spector, 3615 Woolworth Bldg. 233 Broadway, both of New York, N.Y. 10007

Filed Mar. 17, 1978, Ser. No. 887,874

Int. Cl.[2] A61L *13/04, 3/00*

U.S. Cl. 422—243 2 Claims

1. A plant growth inhibitor adapted for placement in a water container, comprising in combination a copper pipe and means for causing movement of said pipe in said water in response to water motion, wherein said means comprises a float oscillator mounted on one end of said pipe to urge said pipe to a vertical position and a tapered pivot at the opposite end of said pipe.

4,202,859

CRYSTALLIZER

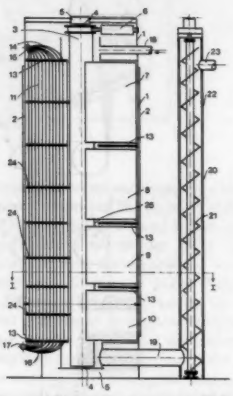
Rud F. Madsen, Nakskov; Jens H. Jensen, Horsholm, and Jens C. Engvad, Assens, all of Denmark, assignors to Aktieselskabet de Danske Sukkerfabrikker, Copenhagen, Denmark

Filed Sep. 27, 1977, Ser. No. 837,469

Claims priority, application Denmark, Sep. 28, 1976, 4359/76

Int. Cl.[2] B01D *9/02*

U.S. Cl. 422—245 6 Claims



1. A crystallizer comprising an elongated container adapted to hold a crystallizable liquid, cooling elements in the form of at least one bundle of stationary spaced cooling pipes extending longitudinally of and within said container, means for passing coolant through said cooling pipes, a shaft extending longitudinally of and within said container, and at least one wing extending longitudinally of and being attached to said shaft, said shaft being connected to means for effecting an oscillating movement of said shaft so that said at least one wing forces the crystallizable liquid through the spaces between and along the surfaces of said cooling pipes to generate a crystallization thereof.

4,202,860

CONTINUOUS SEPARATION OF URANIUM ISOTOPES

Tetsuya Miyake, Tokyo; Norito Ogawa, Yokohama; Motohisa Asano, Yokohama, and Kazuo Okuyama, Yokohama, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed May 23, 1977, Ser. No. 799,891

Claims priority, application Japan, May 28, 1976, 51-61973; Jun. 1, 1976, 51-62900

Int. Cl.[2] C01G *43/00*

U.S. Cl. 423—6 15 Claims

1. In a process for continuously separating uranium isotopes by oxidation-reduction reaction in an acidic solution comprising forming a uranium adsorption zone on a body of anion exchanger, displacing the uranium adsorption zone through the body of anion exchanger by oxidation and reduction reactions of uranium with an oxidizing agent and a reducing agent in contact with the uranium adsorption zone, the improvement which comprises:

subjecting an eluant containing the deactivated oxidizing agent and the deactivated reducing agent as a mixture to an oxidation reaction to regenerate the deactivated oxidizing agent without affecting the the deactivated reducing agent,

separating the regenerated oxidizing agent from the resulting eluant with the anion exchanger used for isotope separation, and

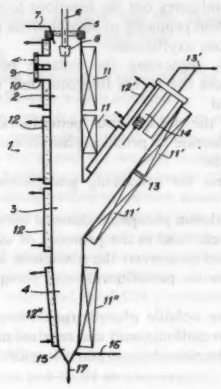
reusing the regenerated oxidizing agent separated for the oxidation of uranium.

4,202,861

METHOD FOR DRY REPROCESSING OF IRRADIATED NUCLEAR FUELS

Michel Bourgeois, Paris; Georges Manevy, Bievres, and Jean-Pierre Roux, Pont St. Esprit, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Sep. 15, 1977, Ser. No. 833,683
Claims priority, application France, Sep. 20, 1976, 76 28147
Int. Cl.[2] C01G *56/06, 43/06*
U.S. Cl. 423—19 **10 Claims**



1. A method for dry reprocessing of irradiated nuclear fuels in the solid particulate state selected from the group consisting of the oxides, carbides and nitrides of plutonium and/or uranium and mixtures thereof comprising a first step wherein said nuclear fuels are contacted within a first zone of an enclosure with a first gas mixture containing at least one first fluorination reagent to convert at least a portion of said nuclear fuels to gaseous plutonium and/or uranium hexafluorides in a self-maintained flame reaction, and a second step wherein a remaining portion of said nuclear fuels not converted to gaseous hexafluorides in said first step is contacted directly within a second zone of said enclosure with a fluidized bed which has been fluidized by means of a second gas mixture containing at least one second fluorination reagent.

4,202,862

REMOVAL OF 3-MERCAPTO-4-METHYL-2-PENTANONE FROM ZIRCONIUM/HAFNIUM SEPARATION PROCESSES

Lawrence J. Jacoby, Albany; Richard A. Rosenau, Salem; Dorothy P. Carter; Ralph H. Nielsen, both of Albany, and Kenneth C. Ash, Corvallis, all of Oreg., assignors to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Aug. 28, 1978, Ser. No. 937,446
Int. Cl.[2] C01G *25/00, 27/00*
U.S. Cl. 423—70 **4 Claims**

1. In a methyl isobutyl ketone liquid-liquid extraction method for separating zirconium from hafnium wherein ammonium thiocyanate is used as a complexing agent and wherein 3-mercapto-4-methyl-2-pentanone is formed in the ammonium thiocyanate-methyl isobutyl ketone regeneration process the improvement comprising preventing the formation of 3-mercapto-4-methyl-2-pentanone in said regeneration process comprising maintaining a pH of from 4 to 9 and a temperature below 150° F.

4,202,863

SEPARATION OF IRON METAL VALUES FROM TITANIUM METAL VALUES

William K. Tolley, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Nov. 27, 1978, Ser. No. 963,870
Int. Cl.[2] C01G *23/04*
U.S. Cl. 423—82 **7 Claims**

1. A process for the separation of iron metal values from titanium metal values in a metal bearing source selected from the group consisting of ilmenite and rutile which comprises:

(a) treating said ilmenite or rutile to a reductive roast at a temperature of from about 650° C. to about 1000° C. in the presence of a reducing gas;

(b) leaching said reduced ilmenite or rutile of step (a) at an elevated temperature of from about 50° C. to about 105° C. with a leaching solution comprising an aqueous hydrogen chloride solution containing from about 1 volume percent to about 10 volume percent of a phosphoric acid to form a leach liquid and undissolved titanium metal values;

(c) separating said leach liquor from said undissolved titanium metal values; and

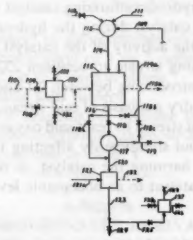
(d) recovering said titanium metal values.

4,202,864

PROCESS FOR CONTROLLING ENVIRONMENTAL POLLUTION FROM STEAM CONTAINING HYDROGEN SULFIDE

Jerome S. Spevack, New Rochelle, N.Y., assignor to Deuterium Corporation, New Rochelle, N.Y.

Filed Sep. 1, 1978, Ser. No. 938,942
The portion of the term of this patent subsequent to Oct. 31, 1995, has been disclaimed.
Int. Cl.[2] F22G *1/00;* **F03G** *7/02;* **C01B** *17/16, 31/20*
U.S. Cl. 423—220 **69 Claims**



1. A process for controlling pollution of the environment by discharges from a system which utilizes a flow of steam at superatmospheric pressure, said steam being from a source of superatmospheric pressure and containing minor amounts of noncondensable gases including hydrogen sulfide as impurities therein, which process comprises:

(a) providing an aqueous liquid phase containing reactant dispersed therein, said reactant comprising at least a metal compound having the capability of undergoing reaction with aqueous hydrogen sulfide at the temperature and in the presence of said flow of steam to form a solid metal sulfide reaction product suspended in said liquid, said metal sulfide having a solubility product, a 25° C., smaller than 10×10^{-15},

(b) contacting at elevated temperature and superatmospheric pressure said flow of impure steam with said aqueous liquid to extract hydrogen sulfide from said impure steam by transferring the same into said liquid and effecting said reaction with hydrogen sulfide therein at said elevated temperature,

(c) delivering from step (b) the resultant aqueous liquid and solid reaction product and the resultant flow of steam, at

substantially said elevated temperature and superatmospheric pressure, containing noncondensable gases but depleted in hydrogen sulfide, and

(d) making the aforesaid discharges from said system to the environment from said resultants delivered in step (c), whereby such discharges are substantially free of hydrogen sulfide.

4,202,865

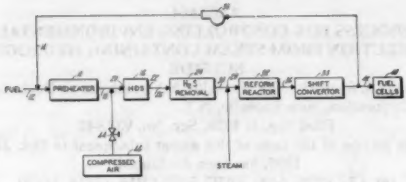
ON-LINE REGENERATION OF HYDRODESULFURIZATION CATALYST

John L. Preston, Jr., Hebron, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Oct. 30, 1978, Ser. No. 956,300

Int. Cl.[2] B01J *8/00;* **C10G** *23/02*

U.S. Cl. 423—244 **10 Claims**



1. In a method for hydrodesulfurizing a stream comprising a hydrocarbon feedstock and hydrogen by passing said stream through a bed of hydrodesulfurizing catalyst wherein carbon is deposited on said catalyst during the hydrodesulfurizing process and reduces the activity of the catalyst, the steps of preheating the incoming stream to between 232° C. and 343° C. and periodically introducing between 0.1 and 1.0 volume percent oxygen, on a dry gas basis of said stream, into the catalyst bed along with said stream to react said oxygen with the deposited carbon, without significantly affecting the hydrodesulfurizing reaction or harming the catalyst, to reduce the carbon deposits on said catalyst to an acceptable level.

4,202,866

PRODUCTION OF STABLE VANADIUM TETRACHLORIDE

Henry H. Feng, Ardsley; John P. D'Acierno, Ossining, and Adam E. Skrzec, West Nyack, all of N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Filed May 24, 1978, Ser. No. 909,159

Int. Cl.[2] C01G *31/00*

U.S. Cl. 423—265 **8 Claims**

1. A method of stabilizing vanadium tetrachloride against decomposition into vanadium trichloride and chlorine which comprises incorporating therein an amount of phosphorus trichloride effective to preclude said decomposition.

5. A stabilized vanadium tetrachloride composition comprising vanadium tetrachloride and an amount of phosphorus trichloride effective to preclude decomposition of said vanadium tetrachloride into vanadium trichloride and chlorine.

4,202,867

PROCESS FOR MANUFACTURE OF PHOSPHORIC ACID AND PHOSPHORUS PENTAFLUORIDE

Curtis W. Cannon, San Diego, Calif., and Robert N. Hall, Boulder, Colo., assignors to Climax Chemical Corporation, Hobbs, N. Mex.

Continuation-in-part of Ser. No. 939,958, Sep. 6, 1978, abandoned, which is a continuation-in-part of Ser. No. 828,925, Aug. 29, 1977, abandoned. This application Jan. 4, 1979, Ser. No. 987

Int. Cl.[2] C01B *25/10, 25/16*

U.S. Cl. 423—301 **28 Claims**

1. A process for making phosphoric acid comprising:

contacting calcium phosphate material with sufficient excess fluorosulfonic acid in the presence of sufficient water to catalyze and carry out the reactions to convert the phosphate content primarily to phosphorous pentafluoride and phosphorous oxyfluoride;

subsequently, separating the volatile phosphorous compounds from the excess fluorosulfonic acid and residual matter, and

hydrolyzing the phosphorous pentafluoride and phosphorous oxyfluoride to produce phosphoric acid and hydrogen fluoride.

20. A process for producing phosphorous pentafluoride comprising:

contacting calcium phosphate material with sufficient excess fluorosulfonic acid in the presence of sufficient water to catalyze and to convert the phosphate content primarily to phosphorous pentafluoride and phosphorous oxyfluoride,

separating the volatile phosphorous compounds from the excess fluorosulfonic acid and residual matter, and

recovering the phosphorous pentafluoride.

4,202,868

PRODUCTION OF HIGH-DENSITY CARBON MATERIALS

Kiyoshige Hayashi, Tokyo; Masanao Nakagawa, Ichihara; Kazuo Ozaki, Ichihara, and Yoshiharu Ito, Ichihara, all of Japan, assignors to Maruzen Petrochemical Co., Ltd., Tokyo, Japan

Filed Jun. 28, 1977, Ser. No. 810,741

Claims priority, application Japan, Jul. 1, 1976, 51-77010; Jul. 27, 1977, 52-64881

Int. Cl.[2] C01B *31/00, 31/02, 31/04*

U.S. Cl. 423—445 **11 Claims**

1. A process for the production of a high-density carbon material from a green coke comprising the steps of (a) molding by pressing in a mold a finely pulverized green coke, by itself without the aid of a binder, (b) demolding the molded green coke (c) baking the molded green coke at a sintering temperature to form a sintered carbon material, characterized in that the green coke to be molded is used in the form of a composition comprising a finely pulverized green coke in intimate admixture with 1–15% by weight based on the weight of the green coke of incorporated water or an incorporated monohydric alcohol selected from the group consisting of an alkanol containing 4–8 carbon atoms and benzyl alcohol, whereby to prevent or reduce laminar cracks caused in the molded green coke at the demolding step.

4,202,869

PROCESS FOR THE DESULFURIZATION OF FLUE GASES

David Lurie, 539 Covington Pl., Wyckoff, N.J. 07481

Division of Ser. No. 688,133, May 20, 1976, Pat. No. 4,134,961. This application May 9, 1978, Ser. No. 904,329

Int. Cl.[2] C01B *17/16, 17/02;* **C01F** *7/02*

U.S. Cl. 423—563 **2 Claims**

1. A process for the preparation of gaseous hydrogen sulfide and an aqueous sodium aluminate-sodium hydroxide solution,

which consists essentially in mixing a fluid molten mixture of aluminum sulfide and sodium sulfide in 1:1 to 1:2 Al_2O_3:Na_2O equivalent molar ratio with a sufficient amount of water to provide a solution having a temperature in excess of about 30° C. and to cause evolution of hydrogen sulfide therefrom.

4,202,870

PROCESS FOR PRODUCING ALUMINA

Willis W. Weber, South Salem; Alexander J. Caglione, Nyack; Albert C. Frost, Congers, all of N.Y., and Thomas J. Weeks, Jr., Columbus, Ohio, assignors to Union Carbide Corporation, New York, N.Y.

Filed Apr. 23, 1979, Ser. No. 32,641
Int. Cl.[2] C01F 7/02
U.S. Cl. 423—630 4 Claims

1. Process for the preparation of alumina by the hydrolysis of an aluminum alkoxide which comprises

(a) providing in a reactor a reaction system comprising two substantially immiscible liquid phases, the first liquid phase being water and the second liquid phase being a solution of $Al(OR)_3$ in ROH wherein "R" is an alkyl radical containing sufficient carbon atoms to render the ROH compound containing same substantially immiscible with water at 25° C. and one atmosphere;

(b) heating said reaction system to a temperature at least as high as the azeotropic temperature, at one atmosphere pressure, of water and the ROH constituent thereof having the lowest boiling point;

(c) bubbling steam upward through said reaction system whereby $Al(OR)_3$ is hydrolyzed to form particles of hydrated alumina and ROH as a by-product;

(d) withdrawing overhead from the reactor an azetropic mixture of water and ROH;

(e) passing the said particles of hydrated alumina downwardly through the reactor as an aqueous slurry countercurrently to the flow of steam bubbles for a period of time sufficient to strip occluded alcohol therefrom;

(f) removing the substantially alcohol-free alumina particles from the reactor as a slurry in a portion of the water in said reactor; and

(g) introducing additional water, $Al(OR)_3$ and ROH into said reaction system under conditions which maintain essentially a steady state in said reactor.

4,202,871

PRODUCTION OF ACICULAR FERRIC OXIDE

Seiji Matsumoto, Sakai; Tadashi Koga, Osaka; Kiyoshi Fukai, Sakai, and Shinya Nakatani, Kishiwada, all of Japan, assignors to Sakai Chemical Industry Co., Ltd., Sakai, Japan

Filed Nov. 6, 1978, Ser. No. 957,861
Claims priority, application Japan, Nov. 14, 1977, 52/137087; Nov. 18, 1977, 52/139271
Int. Cl.[2] C01G 49/06, 49/08; B01J 17/04
U.S. Cl. 423—632 12 Claims

1. A method for producing single crystalline, acicular ferric oxide particles which comprises maintaining an aqueous suspension of amorphous ferric hydroxide at an elevated temperature from 80° C. to 300° C. at an alkaline pH in the presence of an effective amount of a growth-regulating agent dissolved in said suspension, said agent being selected from the group consisting of an organic phosphonic acid, a salt thereof, an ester thereof, a hydroxycarboxylic acid, a salt thereof, and an ester thereof, said elevated temperature being maintained for a length of time sufficient to convert said amorphous ferric hydroxide into said acicular ferric oxide particles.

4,202,872

DETERMINATION OF HEPARIN IN BLOOD PLASMA

Désiré J. Collen, Winksele, Belgium, assignor to Leuven Research & Development V.Z.W., Léuvéin, Belgium

Filed Mar. 1, 1977, Ser. No. 773,192
Claims priority, application Netherlands, Mar. 8, 1976, 7602423
Int. Cl.[2] G01N 33/16; A61K 43/00
U.S. Cl. 424—1 6 Claims

1. A method of determining heparin in blood plasma comprising contacting the blood plasma to be examined with antibodies to thrombin-antithrombin-III complex to cause reaction between heparin-antithrombin III complex and the said antibodies to thrombin-antithrombin-III complex, observing an onset of reaction, and determining presence of heparin from such observation by comparison with blood plasmas of known heparin content.

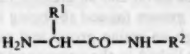
4,202,873

ALKYLOLAMIDES OF IODIZABLE AMINO ACIDS AND IMMUNE TEST REAGENTS CONTAINING THEM

Hans-Georg Batz, Tutzing; Klaus Stellner, Bernried; Hans-Ralf Linke, Wielenbach, and Günter Weimann, Tutzing, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Fed. Rep. of Germany

Filed Mar. 30, 1977, Ser. No. 782,868
Claims priority, application Fed. Rep. of Germany, Apr. 15, 1976, 2616724
Int. Cl.[2] C07C 103/78; C07D 233/02; A61K 43/00
U.S. Cl. 424—1 8 Claims

1. Alkylolamide of an iodizable amino acid, of the formula:



wherein,

R^1 is hydroxybenzyl or dihydroxybenzyl and

R^2 is monohydroxyl-alkyl of 1 or 2 carbon atoms or dihydroxyalkyl of up to 4 carbon atoms,

and the water-soluble salts thereof.

7. Radioiodizable reagents for immune tests in aqueous or physiological solution comprising an alkylolamide of an iodizable amino acid as claimed in claim 1.

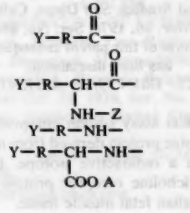
4,202,874

MONORADIOIODINATED DERIVATIVES AND PRECURSORS FOR PRODUCTION THEREON

Anandrao S. Akerkar, Pomona, N.Y., and Herman Rutner, Hackensack, N.J., assignors to Becton Dickinson & Company, Paramus, N.J.

Division of Ser. No. 727,407, Sep. 29, 1976, Pat. No. 4,120,867. This application Mar. 10, 1978, Ser. No. 885,447
Int. Cl.[2] G01N 33/16; A61K 43/00
U.S. Cl. 424—1 17 Claims

1. A tracer for a radioassay comprising a compound having a radioiodinated substituent group selected from the group consisting of:



wherein:

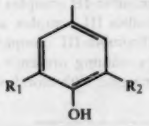
R is selected from the group consisting of straight and branched chain aliphatic hydrocarbons having from 1 to 6 carbon atoms;

X is selected from the group consisting of hydrogen and active ester moieties;

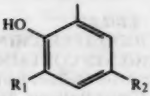
Z is selected from the group consisting of acyl or benzyloxycarbonyl;

Y is selected from the group consisting of:

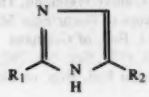
I



II



III



wherein one of R_1 and R_2 is a radioisotope of iodine and the other of R_1 and R_2 is selected from the group consisting of lower alkyl, lower alkoxy, fluoro-, chloro-, bromo-, and nitro-;

A is selected from the group consisting of hydrogen, lower alkyl, an alkali metal and an alkaline earth metal;

said substituent groups (a) and (b) being linked to the compound through an amino group and said substituents (c) and (d) being linked to the compound through a

group, said compound being selected from the group consisting of antigens, haptens, antibodies and compounds having naturally occurring receptors.

17. In a radioassay employing a radioiodinated tracer, the improvement comprising:

employing as said tracer a tracer as defined in claim 1.

4,202,875

RECEPTOR FOR BIOCHEMICAL ASSAY SYSTEM

Jon M. Lindstrom, Del Mar, Calif., assignor to The Salk Institute for Biological Studies, San Diego, Calif.

Filed Mar. 20, 1978, Ser. No. 888,347

The portion of the term of this patent subsequent to Jul. 5, 1994, has been disclaimed.

Int. Cl.[2] G01N *33/16*; A61K *43/00*

U.S. Cl. 424—1 **3 Claims**

1. In a biochemical assay system comprising a complex of acetylcholine receptor protein derived from muscle tissue with toxin labeled with a radioactive isotope, the improvement wherein the acetylcholine receptor protein is derived from non-human mammalian fetal muscle tissue.

4,202,876

INVESTIGATING BODY FUNCTION

Reginald Monks, and Anthony L. M. Riley, both of Amersham, England, assignors to The Radiochemical Centre Limited, England

Filed Jan. 4, 1978, Ser. No. 866,853

Claims priority, application United Kingdom, Jan. 7, 1977, 628/77

Int. Cl.[2] A61K *29/00, 43/00*

U.S. Cl. 424—1.5 **9 Claims**

1. A method for investigating body function of a mammal, comprising introducing a γ-emitting radioactive Se or Te labelled derivative of a bile acid or a bile salt comprising an amino acid conjugate of a bile acid or a metabolic precursor thereof in to the live mammal, and after the elapse of a suitable period of time determining the distribution of the radioactivity.

4,202,877

ANTIDERMATOMYCOTIC AGENT

Masaki Sato, Sagamihara; Takao Kawasaki, Sayama, and Yasushi Nagane, Tokyo, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 9, 1978, Ser. No. 958,973

Claims priority, application Japan, Nov. 21, 1977, 52-139717

Int. Cl.[2] A61K *0/00, 31/11*

U.S. Cl. 424—43 **9 Claims**

8. A method of treating a human patient suffering from dermatomycosis which comprises contacting the skin area afflicted by dermatomycosis with an effective amount of o-methoxycinnamaldehyde capable of inhibiting dermatomycosis.

4,202,878

COMPOSITIONS OF MATTER FOR COLORING TOOTHPASTE AND METHOD OF PREPARING SAME

Lyle W. Ritze, Hamilton Township, Warren County, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 744,078, Nov. 22, 1976, Pat. No. 4,129,638, which is a continuation of Ser. No. 507,636, Sep. 20, 1974, abandoned, which is a division of Ser. No. 837,303, Jun. 27, 1969, abandoned. This application Jun. 22, 1978, Ser. No. 917,813

Int. Cl.[2] A61K *7/16*

U.S. Cl. 424—49 **4 Claims**

1. A process for preparing agglomerates of pigment particles in a toothpaste base which comprises the steps of:

(1) melting a wax having a hardness value of from 0 to 65 selected from the group consisting of carnauba wax, candellila wax, montan wax, castor wax, ceresin wax, bayberry wax and paraffin;

(2) uniformly dispersing water-insoluble, non-toxic, colorfast, pigment particles having a mean particle size within the range from about 5 to about 490 microns in the molten wax, said particles being selected from the group consisting of dyed thermosetting resin particles, chromium oxide pigments, carbon blacks, ultramarine blues, ultramarine pinks, ferric oxides, dyed cellulose particles and water insoluble dye lakes;

(3) cooling the wax dispersion of pigment particles to solidification, said solidification yielding the final agglomerates or larger pieces;

(4) reducing the solid wax dispersion to agglomerates having a mean particle size within the range from about 200 to about 500 microns and a pigment particle concentration of from about 30% to about 50% by weight of the total agglomerates; and

(5) dispersing said agglomerates in a toothpaste base of a different color than the agglomerates, in sufficient amount so as to produce a speckled effect in the toothpaste base.

4,202,879

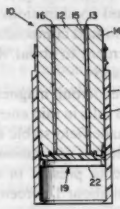
THREE PHASE ANTIPERSPIRANT STICK

David L. Shelton, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 883,075, Mar. 3, 1978, abandoned, which is a continuation-in-part of Ser. No. 817,075, Jul. 18, 1977, abandoned. This application Jul. 13, 1978, Ser. No. 924,478

Int. Cl.[2] A61K *7/34, 7/38*

U.S. Cl. 424—66 13 Claims



1. An antiperspirant composition in the form of a three-phase stick, said composition comprising:

(A) from about 35% to 65% by weight of the composition of an antiperspirant phase comprising a solid, shearable vehicle which contains an astringent antiperspirant material;

(B) from about 35% to 65% by weight of the composition of a gel phase, said gel phase comprising

I. from about 10% to 92% by weight of the gel phase of a polyhydric aliphatic alcohol containing 2 to 3 carbon atoms and from 2 to 3 hydroxy groups;

II. from about 5% to 15% by weight of the gel phase of a gel forming agent selected from the group consisting of a sodium salt of a fatty acid containing 14 to about 18 carbon atoms and a potassium salt of a fatty acid containing from about 14 to about 18 carbon atoms; and

(C) from about 1% to 10% by weight of the composition of an interjacent barrier phase contiguous to the gel phase and the antiperspirant phase, wherein the barrier phase has a thickness of at least about 0.005 inch and comprises:

I. from about 10% to 40% by weight of the barrier phase of a water-insoluble, alcohol-insoluble high melting point wax or mixtures thereof which has a melting point of from about 150° F. to 215° F.; and

II. from about 20% to 90% by weight of the barrier phase of a water-insoluble, liquid organic emollient,

and wherein the barrier phase is relatively free of particulate materials and is free of materials capable of reducing the pH of the gel phase below about 9.5 in the region of the gel/barrier interface.

4,202,880

DELIVERY MEANS FOR BIOLOGICALLY ACTIVE AGENTS COMPRISING HYDROPHILIC POLYURETHANE

Francis J. T. Fildes, Macclesfield, and Francis G. Hutchinson, Lymm, both of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Nov. 28, 1977, Ser. No. 855,332

Claims priority, application United Kingdom, Dec. 13, 1976, 51917/76

Int. Cl.[2] A61K *31/785;* C08G *18/48, 18/14*

U.S. Cl. 424—78 5 Claims

1. A sustained release delivery means comprising (i) a functionally effective amount of a biologically active agent and (ii) a linear hydrophilic block polyoxyalkylene-polyurethane copolymer, substantially devoid of crosslinking, and containing 30 to 70% by weight of hydrophilic regions and 70 to 30% by weight of hydrophobic regions, the hydrophilic regions being composed of polyoxyethylene of molecular weight 600 to 6,000, and the hydrophobic regions being composed of a polyurethane which is obtainable by reacting 4,4'-diphenylmethane diisocyanate with 1,1'-isopropylidene-bis-p-phenyleneoxy-dipropanol-2.

4,202,881

HAIR SHAMPOO AND CONDITIONING LOTION

Paul Gross; Eugen Konrad, both of Darmstadt, Fed. Rep. of Germany, and Herbert Mager, Fribourg, Switzerland, assignors to Wella AG, Darmstadt, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 743,290, Nov. 18, 1976, Pat. No. 4,134,412. This application Oct. 19, 1978, Ser. No. 952,857

Claims priority, application Fed. Rep. of Germany, Jun. 18, 1976, 2627419

Int. Cl.[2] A61K *7/06*

U.S. Cl. 424—70 8 Claims

1. A process of shampooing and conditioning human hair which comprises applying to the hair a lotion comprising an aqueous or aqueous-alcoholic solution, emulsion or gel containing 0.05 to 6% by weight of a water soluble salt of chitosan, said chitosan salt having been prepared by reacting chitosan or a chitin product containing about 70 to 90% by weight of chitosan with a sufficient amount of acid to neutralize the free amino groups present in said chitosan and to form a water soluble salt thereof.

4,202,882

NOVEL DEODORIZING METHOD

Herbert Schwartz, 1963 N. Maurice River Pkwy., Vineland, N.J. 08360

Continuation-in-part of Ser. No. 420,970, Dec. 3, 1973, abandoned. This application Oct. 21, 1975, Ser. No. 624,319

Int. Cl.[2] A61L *13/00*

U.S. Cl. 424—76 6 Claims

1. A method of combatting odors comprising contacting the odor causing compounds with an amount sufficient to combat odors of a composition consisting essentially of a tetraazaheterocycle selected from the group consisting of hexamethylenetetramine, 1,3,6,8-tetraazatricyclo [4,4,1,$1^{3,8}$]dodecane and 4,5,9,10-dibenzo-1,3,6,8-tetraazatricyclo[4,4,1,$1^{3,8}$]dodecane and a quaternary ammonium salt, the ratio of heterocycle to quaternary ammonium salt being 10:1 to 1:10.

4,202,883

VACCINE FOR TYZZER'S DISEASE IN RABBITS

Roger P. Orcutt, North Andover, Mass., assignor to The Charles River Breeding Laboratories, Inc., N. Wilmington, Mass.

Filed May 10, 1979, Ser. No. 38,012

Int. Cl.[2] A61K *39/02*

U.S. Cl. 424—92 10 Claims

1. A vaccine for Tyzzer's disease in rabbits, said vaccine comprising the reaction product, in an aqueous vehicle, of a fixing agent and hepatic or intestinal tissue from immunosuppressed rodents infected with *Bacillus piliformis.*

4,202,884

DERIVATIVE OF LYSOZYME

Arthur G. Schnek, Brussels; Yvan-Roger-Jean Looze, Wavre, and Marc M. Deconinck, Hamme-Mille, all of Belgium, assignors to Prospa S.A., Brussels, Belgium

Filed Oct. 31, 1978, Ser. No. 957,001

Claims priority, application United Kingdom, Nov. 1, 1977, 45411/77

Int. Cl.[2] A61K *37/54*

U.S. Cl. 424—94 3 Claims

1. ε-N-trimethyl[lys]-lysozyme.

4,202,885

PROCESS FOR THE PREPARATION OF ANTI-TRANSPLANTED SARCOMA 180 TUMORIGENIC SUBSTANCES

Kiro Asano, Kukizaki; Tsuyoshi Saito; Hiromitsu Tanaka, both of Tokyo, and Satoru Enomoto, Fujisawa, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 13, 1976, Ser. No. 749,621

Claims priority, application Japan, Dec. 18, 1975, 50-150114

Int. Cl.[2] A61K *35/12;* C07H *1/08*

U.S. Cl. 424—95 4 Claims

1. A process for preparing a nitrogen-containing polysaccharide comprising:

contacting a fungus of the genus Coriolus of the Polyporaceae family of class Basidiomycetes selected from the group consisting of *Coriolus biformis, Coriolus conchifer, Coriolus consors, Coriolus hirsutus, Coriolus pargamenus, Coriolus pubescens* and *Coriolus versicolor* with an aqueous solvent under pressure at a temperature within the range of 150° to 200° C. to obtain an extract containing the nitrogen-containing polysaccharide;

refining said abstract to remove substances having a molecular weight less than 5,000;

separating nitrogen-containing polysaccharide from said extract.

4,202,886

ANTIBIOTIC SF-1942 SUBSTANCE AND PROCESS FOR PRODUCTION OF THE SAME

Kazunori Ohba; Takashi Shomura; Yasuaki Ogawa, all of Yokohama; Takashi Tsuruoka, Kawasaki; Hiroshi Watanabe, Yokohama; Takashi Hisamatsu, Yokohama; Shingo Uchida, Yokohama; Michio Kojima, Tokyo, and Shigeharu Inouye, Yokohama, all of Japan, assignors to Meiji Seika Kaisha, Ltd., Tokyo, Japan

Filed May 2, 1978, Ser. No. 902,137

Claims priority, application Japan, May 2, 1977, 52-49896

Int. Cl.[2] A61K *35/74;* C12P *1/06*

U.S. Cl. 424—122 2 Claims

1. An antibiotic SF-1942 substance having the following properties:

Appearance and Nature: White and electrically neutral substance;

Decomposition Point: Gradually melts over a temperature range of from 122° to 134° C. with decomposition (amorphous powder);

Elemental Analysis (by weight): C: 65.57%; H: 7.80%; O: 26.38%; N: 0%;

U.V. Absorption Spectrum: No characteristic maximum U.V. absorption;

I.R. Absorption Spectrum: Absorption bands at 3400, 2960, 1780, 1710, 1630, 1450, 1390, 1020, 780 cm^{-1} and absorption spectrum as shown in FIG. 2 as determined using the KBr tablet method;

Optical Rotation: $[\alpha]_D^{20} = -21.8°$, 1% methanol solution;

Molecular Weight: 350 to 400 as determined by the vapor pressure method;

Solubility: Soluble in ethyl acetate, lower alcohols (C_1–C_3), acetone, benzene and chloroform, and insoluble in water and hexane;

Color Reactions: Positive, Lemieux, sulfuric acid, and 2,4-dinitrophenylhydrazine; Negative, ninhydrin and Greig-Rayback reagent.

Rf Values on TLC (Silica Gel): 0.52 (benzene/methanol; 5:1 by volume) 0.46 (chloroform/methanol; 10:1 by volume) 0.41 (benzene/acetone; 2:1 by volume)

Mobility on Filter Paper High Voltage Electrophoresis: Behaves as electrically neutral substance.

4,202,887

LIVESTOCK FEED SUPPLEMENT

Tully W. Talbot, Audubon, Iowa; George T. Barrows, Kansas City, Mo., and Granville B. Thompson, Amarillo, Tex., assignors to Redel, Inc., Kansas City, Mo.

Filed Jun. 27, 1977, Ser. No. 810,296

Int. Cl.[2] A23K *1/00*

U.S. Cl. 424—154 3 Claims

1. A liquid feed composition consisting essentially of:

a readily available liquid energy source selected from the group consisting of propylene glycol, ethanol, normal propanol, glycerol, and combinations thereof, said energy source being present in said composition in amounts ranging from about 10 percent to about 90 percent by weight of said composition; and

magnesium ions, derived from magnesium salts by completely dissolving said salts in said energy source, whereby said composition is made field stable and can be left unattended in the field without separation of said salts;

said magnesium ions being present in said composition in amounts ranging from about 1 percent to about 6 percent by weight of said composition;

said composition having a pH less than or equal to 7.0; and

said composition being effective to avert nutritional tetany in livestock.

4,202,888

READILY ENTERALLY ABSORBABLE PHARMACEUTICAL COMPOSITIONS OF CARDIAC GLYCOSIDES AND PREPARATION THEREOF

Theodor Eckert; Fritz H. Kemper, both of Muenster; Martin Wischniewski, Neustadt a. Rbge., and Reinhard Hempel, Hanover, all of Fed. Rep. of Germany, assignors to Kali-Chemie Pharma GmbH., Hanover, Fed. Rep. of Germany

Filed Jul. 7, 1977, Ser. No. 813,456

Claims priority, application Fed. Rep. of Germany, Jul. 12, 1976, 2631214; Nov. 18, 1976, 2652508; Dec. 1, 1976, 2654386; Dec. 3, 1976, 2654844

Int. Cl.[2] A61K *31/705;* C07J *17/00*

U.S. Cl. 424—182 12 Claims

1. A readily enterally absorbable pharmaceutical composition which comprises a therapeutically-effective amount of at least one cardiac glycoside selected from the group consisting of g-strophanthin, k-strophanthin and proscillaridin distributed in a substantially non-aqueous vehicle comprising an absorption-enhancing amount of at least one glyceride selected from the group consisting of mono-glycerides and diglycerides of fatty acids of medium chain length containing 6 to 12 carbon atoms and mixtures thereof.

4,202,889

COMBATING ARTHROPODS WITH O-ALKYL-O-(6-ALKOXY-2-CYCLOPROPYL-PYRIMIDIN-4-YL)-(THIONO)THIOL)-PHOSPHORIC (PHOSPHONIC) ACID ESTERS OR ESTER-AMIDES

Fritz Maurer, Wuppertal; Ingeborg Hammann, Cologne, and Wolfgang Behrenz, Overath, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

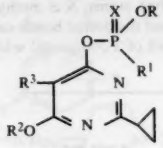
Filed Aug. 4, 1978, Ser. No. 931,082

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1977, 2737401

Int. Cl.[2] A01N *9/36;* C07F *9/65*

U.S. Cl. 424—200 10 Claims

1. An O-alkyl-O-(6-alkoxy-2-cyclopropyl-pyrimidin-4-yl)-(thiono)(thiol)-phosphoric (phosphonic) acid ester or ester-amide of the formula



in which

R is alkyl with 1 to 6 carbon atoms,

R^1 is alkyl, alkoxy, alkylthio or monoalkylamino each with 1 to 6 carbon atoms, or phenyl,

R^2 is alkyl with 1 to 6 carbon atoms,

R^3 is hydrogen, halogen or alkyl with 1 to 5 carbon atoms, and

X is oxygen or sulphur.

8. An arthropodicidal composition containing as active ingredient an arthropodicidally effective amount of a compound according to claim **1** in admixture with a diluent.

9. A method of combating arthropods which comprises applying to the arthropods, or to a habitat thereof, an arthropodicidally effective amount of a compound according to claim **1**.

4,202,890

4-CARBOXY-PHTHALATO(1,2-DIAMINOCYCLOHEXANE)-PLATINUM(II) AND ALKALI METAL SALTS THEREOF WITH CYCLOPHOSPHAMIDE AND HYDROXYUREA IN ALLEVIATING L1210 MURINE LEUKEMIA

Glen R. Gale, and Paul Schwartz, both of Charleston, S.C., assignors to The United States of America as represented by the Department of Health, Education and Welfare, Washington, D.C.

Division of Ser. No. 926,035, Jul. 19, 1978, which is a continuation-in-part of Ser. No. 828,926, Aug. 29, 1977, Pat. No. 4,137,248. This application Dec. 22, 1978, Ser. No. 972,336

Int. Cl.[2] **A61K** *31/675, 31/28, 31/17*

U.S. Cl. 424—200 **2 Claims**

1. A method of alleviating L1210 murine leukemia which comprises administering 4-carboxyphthalato(1,2-diaminocyclohexane)platinum(II) or alkali metal salt thereof I.P. and at antileukemic dosage to a mount of 5–60 mg/kg for up to 10 days wherein cyclophosphamide is added in an effective dosage of about 50 mg/kg of body weight and hydroxyurea is added in an effective dosage of about 1000–1500 mg/kg of body weight, both to provide a ternary treatment.

4,202,891

15-OXYGENATED STEROL COMPOUNDS AND THE USE OF SUCH COMPOUNDS TO INHIBIT THE BIOSYNTHESIS OF STEROLS

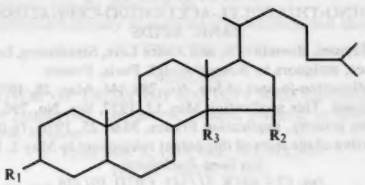
George J. Schroepfer, Jr.; Edward J. Parish, both of P.O. Box 1892, Houston, Tex. 77001, and Andrew A. Kandutsch, 31 Eagle Lake Rd., Bar Harbor, Me. 04609

Filed May 16, 1977, Ser. No. 797,345

Int. Cl.[2] **A61K** *31/56;* **C07J** *9/00*

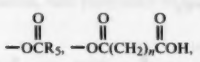
U.S. Cl. 424—242 **63 Claims**

1. A method of inhibiting the biosynthesis of mevalonic acid, and the effects derived therefrom, which comprises administering to a host an amount effective to inhibit biosynthesis of mevalonic acid of a sterol biosynthesis inhibiting 15-oxgenated sterol, said 15-oxygenated sterol having the structural formula:



where:

R_1 is —OH, =O, —OR_4,



a sulfate group, or

a Mg, Na, or K salt of a sulfate group;

R_2 is —OH, =O, or

R_3 is non-existent when there is a double bond between the 8 and 14 carbon atoms or αH, βH, or an αC_1 to C_6 alkyl group;

R_4 is a C_1 to C_6 alkyl group;

R_5 is a C_1 to C_{20} aliphatic group, or a phenyl group, provided that when R_5 forms part of the R_2 substituent, R_5 is a C_1 to C_{20} aliphatic group; and

n is a whole number from 2 to 6, with said R_1 and R_2 substituents, other than when they are =0, being in either the α or β position.

4,202,892

BIOCIDAL METHYLADAMANTYL HYDRAZINES AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Ben-Zion Weiner; Jeffrey Sterling; Raul Suchi, all of Jerusalem, and Haim Yellin, Ramat Gan, all of Israel, assignors to Teva Pharmaceutical Industries, Ltd., Jerusalem, Israel

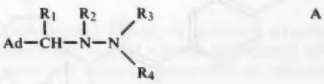
Filed Nov. 22, 1978, Ser. No. 963,114

Claims priority, application Israel, Nov. 22, 1977, 53441

Int. Cl.[2] **A61K** *31/33, 27/00, 31/15;* **C07C** *109/02*

U.S. Cl. 424—244 **44 Claims**

1. A 1- or 2-Adamantylmethyl hydrazine of the general formula A



A

wherein Ad is 1- or 2-adamantyl, R_1 and R_2 are the same or different and are each hydrogen or a lower unsubstituted or substituted alkyl group of 1–4 carbon atoms; R_3 and R_4 are the same or different and are each hydrogen, an unsubstituted or substituted radical being a lower alkyl of 1–4 carbon atoms, a lower alkanoic acid radical or 2–4 carbon atoms or a lower alkyl ester thereof, adamantyl, phenyl, phenethyl, benzyl or an unsubstituted or substituted pyridyl or quilonilyl; or R_3 and R_4 together with the nitrogen atom to which they are attached form a cyclic radical; or a pharmaceutically acceptable acid addition salt thereof.

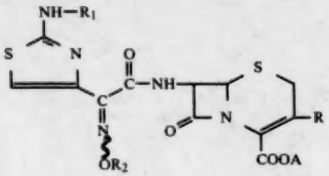
44. A biocidal composition containing as active ingredient a biocidally effective amount of a compound according to claim **1** and a pharmaceutical carrier therefor.

4,202,893
ALKYLOXIMES OF 7-AMINO-THIAZOLYL-ACETAMIDO-CEPHALOSPORANIC ACIDS

René Heymes, Romainville, and André Lutz, Strasbourg, both of France, assignors to Roussel Uclaf, Paris, France

Continuation-in-part of Ser. No. 781,344, Mar. 25, 1977, abandoned. This application May 12, 1977, Ser. No. 796,315
Claims priority, application France, Mar. 25, 1976, 76 08690
The portion of the term of this patent subsequent to May 1, 1996, has been disclaimed.
Int. Cl.[2] A61K *31/545;* C07D *501/36*
U.S. Cl. 424—246 12 Claims

1. A compound of the formula



wherein R is —CH_2—SR', R' is an acyl of an alkanoic acid of 2 to 4 carbon atoms, R_1 is hydrogen, R_2 is selected from the group consisting of alkyl of 1 to 4 carbon atoms and alkenyl and alkynyl of 2 to 4 carbon atoms, A is selected from the group consisting of hydrogen, an alkali metal cation, or equivalent of an alkaline earth metal, and a non-toxic, pharmaceutically acceptable organic amine base cation and OR_2 is in the syn position.

7. An antibiotic composition comprising an antibiotically effective amount of at least one compound of claim 1 and an inert pharmaceutical carrier.

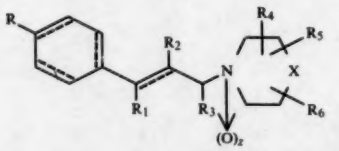
9. A method of treating bacterial infections in warm-blooded animals comprising administering to warm-blooded animals an antibiotically effective amount of at least one compound of claim 1.

4,202,894
PIPERIDINES MORPHOLINES, ETC., AND FUNGICIDAL COMPOSITIONS THEREOF

Albert Pfiffner, Bulach, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Nov. 18, 1977, Ser. No. 852,768
Claims priority, application Austria, Nov. 22, 1976, A 8660/76
Int. Cl.[2] C07D *295/02;* A01N *9/22;* C07D *211/14*
U.S. Cl. 424—248.4 140 Claims

1. A compound of the formula



(I)

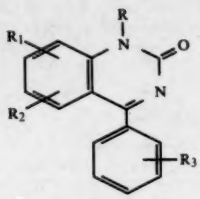
wherein R is alkyl of 4 to 12 carbon atoms, cycloalkyl of 3 to 7 carbon atoms, mono(lower alkyl)-substituted cycloalkyl of 4 to 7 carbon atoms, cycloalkylalkyl of 4 to 12 carbon atoms, phenyl, phenyl-(lower alkyl) of 7 to 12 carbon atoms, or naphthyl-(lower alkyl) of up to 12 carbon atoms in which the phenyl or naphthyl group can be mono- or di-(lower alkyl) substituted; R_1, and R_3, independently, are hydrogen or alkyl of 1 to 8 carbon atoms; R_2 is methyl; R_4, R_5 and R_6, independently, are hydrogen or alkyl of 1 to 8 carbon atoms, and two of R_4, R_5 and R_6 can each be bonded to the same carbon atom or can together form a fused alicyclic or aromatic 6-membered ring; provided that when R is tert.-butyl, at least one of R_1 and R_3 is alkyl of 2 to 8 carbon atoms, or at least one of R_4, R_5 and R_6 is alkyl of 5 to 8 carbon atoms; X is methylene or an oxygen atom; z is zero or 1; and the dotted bonds can be hydrogenated or an acid addition salt of a compound which is basic.

4,202,895
1-POLYHALOALKYL-2(1H)-QUINAZOLINONE DERIVATIVES

Shigeho Inaba, Takarazuka; Michihiro Yamamoto, Toyonaka; Kikuo Ishizumi, Ikeda; Kazuo Mori, Kobe, and Hisao Yamamoto, Nishinomiya, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation-in-part of Ser. No. 153,031, Jun. 4, 1971, abandoned. This application Jun. 14, 1974, Ser. No. 479,464
Int. Cl.[2] A61K *31/505;* C07D *239/82*
U.S. Cl. 424—250 14 Claims

1. A quinazolinone of the formula



(I)

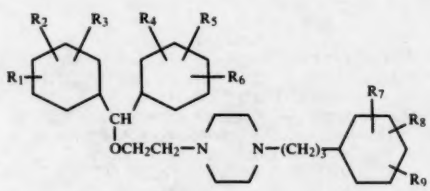
wherein R is a polyhaloalkyl having C_2–C_3 alkyl with at least two fluorine atoms; and R_1, R_2 and R_3 are individually hydrogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, nitro, trifluoromethyl or halogen.

4,202,896
N-BENZHYDRYLOXYETHYL-N-PHENYLPROPYL-PIPERAZINES

Johan Gootjes, Heerhugowaard, Netherlands, assignor to Gist-Brocades N.V., Netherlands

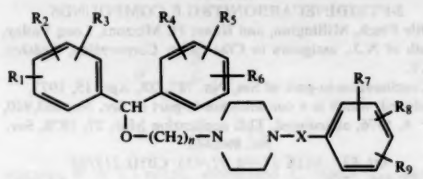
Filed Dec. 14, 1977, Ser. No. 860,460
Claims priority, application United Kingdom, Dec. 14, 1976, 52223/76
Int. Cl.[2] A61K *31/495;* C07D *295/08*
U.S. Cl. 424—250 13 Claims

1. A compound of the formula



wherein R_1–R_9 are the same or different and each represents a hydrogen, fluorine, chlorine or bromine atom or a methyl or methoxy group or acid addition salts thereof.

10. A method of treating Parkinson's disease, prolactin induced disorders and acromegaly which comprises administering an effective amount of compound of the formula



wherein R_1–R_9 are the same or different and each represents a hydrogen, fluorine, chlorine or bromine atom or a methyl or lower alkoxy group, n is 2 or 3 and X represents a $(CH_2)_3$ group or acid addition salts thereof.

4,202,897

PROLACTIN SECRETION INHIBITORS

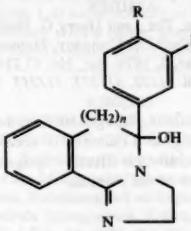
Ronald G. Babington, Denville, and F. Eugene Harrington, Mendham, both of N.J., assignors to Sandoz, Inc., E. Hanover, N.J.

Continuation-in-part of Ser. No. 891,299, Mar. 29, 1978, abandoned, which is a continuation-in-part of Ser. No. 862,366, Dec. 20, 1977, abandoned, which is a continuation-in-part of Ser. No. 818,420, Jul. 25, 1977, abandoned. This application May 11, 1978, Ser. No. 904,191

Int. Cl.[2] A61K *31/495, 31/47, 31/48*

U.S. Cl. 424—250 **21 Claims**

1. A method for inhibiting prolactin secretion which comprises administering to a mammal in need of said treatment an effective amount of a compound of the formula



(I)

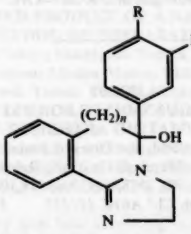
where

n represents 0 or 1,

each R, independently, represents hydrogen or halo of atomic weight about 19–36,

or a pharmaceutically acceptable acid addition salt thereof.

6. A method for enhancing the prolactin secretion inhibition activity of chemical agents so active which comprises administering to a mammal in need of said treatment an effective amount of both said chemical agent and an effective amount of a compound of formula (I)



(I)

where

n represents 0 or 1,

each R, independently, represents hydrogen or halo of atomic weight about 19–36,

or a pharmaceutically acceptable acid addition salt thereof.

4,202,898

METHOD OF TREATING ANXIETY AND DEPRESSION

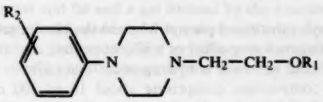
Henri Depoortere, Dampierre, France, assignor to Synthelabo, Paris, France

Filed Jun. 5, 1978, Ser. No. 912,738

Int. Cl.[2] A61K *31/495*

U.S. Cl. 424—250 **7 Claims**

1. A method of treating anxiety or depression which comprises administering to a patient suffering from anxiety or depression an effective dosage of a piperazine to relieve said anxiety or depression, said piperazine having the formula:



wherein

R_1 is hydrogen or —CO(lower alkyl); and

R_2 is hydrogen, halogen, trifluoromethyl or trifluoromethylthio

or a pharmaceutically acceptable acid addition salt thereof.

4,202,899

8H-PYRAZOLO[1,5-A]PYRAZOLO[4',3':5,6]PYRIDO[3,4-E]PYRIMIDINE

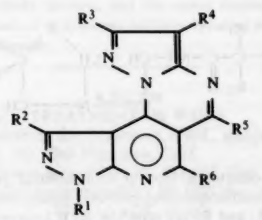
Theodor Denzel, Regensburg, and Hans Hoehn, Tegernheim, both of Fed. Rep. of Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Apr. 21, 1976, Ser. No. 679,121

Int. Cl.[2] A61K *31/505*; C07D *471/22, 487/22*

U.S. Cl. 424—251 **24 Claims**

1. A compound of the formula



wherein

R^1 is hydrogen, lower alkyl, phenyl, phenyl-lower alkylene, benzoyl or substituted benzoyl wherein the benzoyl substituent is one or two halogens, lower alkyl or trifluoromethyl groups;

R^2 and R^3 each is hydrogen, lower alkyl or phenyl;

R^4 is hydrogen, lower alkyl, phenyl, carbonyl or lower alkoxycarbonyl;

R^5 is lower alkoxy, substituted lower alkoxy wherein the substituent is

phenyloxy, substituted phenyloxy wherein the phenyl ring bears one or two halogen, lower alkyl or trifluoromethyl groups, halo,

or —S—R^9,

R^6 is hydrogen or lower alkyl;

R^7 is hydrogen, lower alkyl or substituted lower alkyl wherein the substituent is

phenyl, substituted phenyl wherein the phenyl substituent is halogen, lower alkyl or trifluoromethyl, and R^8,

R^9, R^{10} and R^{11} each is hydrogen or lower alkyl.

22. A composition comprising about 10 to 300 mg. of a compound of claim 1 and a physiologically acceptable carrier therefor.

4,202,900

DERIVATIVES OF PENAM-3-CARBOXYLIC ACID AND A PHARMACEUTICAL COMPOSITION CONTAINING THE SAME

Karoly Kocsis, Basel; Bruno Fechtig, Reinach, and Hans Bickel, Binningen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

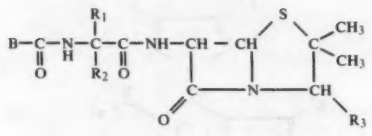
Continuation of Ser. No. 749,934, Dec. 13, 1976, abandoned, which is a division of Ser. No. 398,512, Sep. 18, 1973, Pat. No. 4,015,000. This application Apr. 28, 1978, Ser. No. 900,696

Claims priority, application Switzerland, Sep. 27, 1972, 14257/72; Mar. 14, 1973, 3694/73; May 24, 1973, 7444/73

Int. Cl.[2] **A61K** *31/43;* **C07D** *499/68*

U.S. Cl. 424—251 **6 Claims**

1. A compound of the formula I



(I)

wherein R_3 denotes a free or conventional penicillin the rapeutically useable esterified carboxyl group, and wherein, if the radicals R_1 and R_2 are separate, R_1 is hydrogen and R_2 is phenyl, thienyl, furyl, or phenyl, which is substituted by lower alkyl with up to 6 carbon atoms, lower alkoxy with up to 4 carbon atoms, halogen, trifluoromethyl, nitro, carbamoyl, or lower alkanoyl with up to 6 carbon atoms, and, if the radicals R_1 and R_2 are linked, they form, together with carbon atoms, a cycloalkyl with up to 7 carbon atoms, and wherein B represents 1,2,3,6-tetrahydro-2,6-dioxo-pyrimidyl, a 2,6-dichloropyrimidyl or 2,6-dimethoxypyrimidyl, in which the pyrimidyl groups are bonded in 4- or 5-position of the ring at a carbon atom and are unsubstituted or substituted at a carbon atom by halogen, lower alkyl with up to 4 carbon atoms or phenyl, and conventional therapeutically useable salts thereof with the proviso that if R_1 is hydrogen, R_2 is phenyl and R_3 is carboxyl, B does not represent an unsubstituted 1.2.3.6-tetrahydro-2.6-dioxo-pyrimidyl radical, which is bonded in 5-position.

6. A pharmaceutical preparation for combating infections caused by gram-positive or gram-negative bacteria which comprises a therapeutically effective amount of a compound of formula I of claim 1 in the presence of a pharmaceutically usable excipient.

4,202,901

2-PYRIDINECARBONITRILE COMPOUNDS

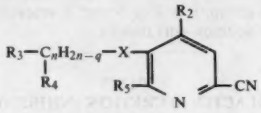
Neville Finch, Millington, and Renat H. Mizzoni, Long Valley, both of N.J., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 787,718, Apr. 15, 1977, abandoned, which is a continuation-in-part of Ser. No. 663,940, Mar. 4, 1976, abandoned. This application Mar. 27, 1978, Ser. No. 890,441

Int. Cl.[2] **A61K** *31/44, 31/455;* **C07D** *213/84*

U.S. Cl. 424—263 **5 Claims**

1. A compound of the formula



wherein R_2 and R_5 is hydrogen, lower alkyl, lower alkoxy or halogeno, X is oxygen or sulfur, R_3 is phenyl or phenyl substituted by one or more than one member selected from lower alkyl, lower alkoxy, halo, trifluoromethyl, cyano or amino, R_4 is hydrogen or hydroxy, n is an integer from 1 to 7, q is 1 or 3, (n−q) is positive.

4,202,902

LIPOGENESIS CONTROL BY CYCLOPROPANE-CARBOXYLIC ACIDS, ESTERS AND AMIDES

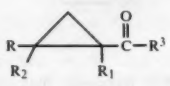
John B. Carr, Houston, Tex., and Harry G. Durham, Modesto, Calif., assignors to Shell Oil Company, Houston, Tex.

Filed Mar. 5, 1979, Ser. No. 17,214

Int. Cl.[2] **A61K** *31/22, 31/275, 31/215, 31/16*

U.S. Cl. 424—298 **1 Claim**

1. A method for inhibiting lipogenesis in a mammal, which comprises administering, to a mammal in need of such treatment, orally or parenterally, an effective lipogenesis inhibiting amount of a compound of the formula:



(I)

consisting of two subclasses:

(1) R is alkyl having 4 to 10 carbon atoms, acetoxymethyl. or phenyl, R^1 and R^2 each is hydrogen, or —CN, with the proviso that one of them is hydrogen, and R^3 is —NH_2, or —OR^4, wherein R^4 is alkyl having 1 to 4 carbon atoms;

(2) R is alkyl having 6 to 16 carbon atoms, or is phenyl, R^1 and R^2 each is hydrogen or —CN, with the proviso that one of them is hydrogen and R^3 is —OH.

4,202,903

ACYL CYANOGUANIDINES FOR TREATING RHEUMATOID ARTHRITIS

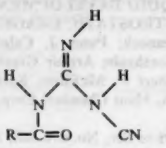
Tsung-Ying Shen, Westfield, and Howard Jones, Holmdel, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Sep. 30, 1975, Ser. No. 618,108

Int. Cl.[2] **A61K** *31/155*

U.S. Cl. 424—326 **1 Claim**

1. A method of treating rheumatoid arthritis which comprises administering to a patient a therapeutically effective amount of a compound of the formula:



I

wherein R is C_{1-7}alkyl, substituted C_{1-7}alkyl, C_{1-5}alkoxy, phenyl or substituted phenyl, wherein substituted C_{1-7}alkyl is C_{1-7}alkyl substituted with one or more C_{1-3}alkyl or halo groups and substituted phenyl is phenyl substituted with one or more hydroxy, mercapto, halo, cyano, phenyl, carboxymethylthio, nitro, amino, N-C_{1-5}alkylamino or N,N-di(C_{1-5}-alkyl-)amino groups.

4,202,904

BIS(DIPHENYLAMINOMETHANE)ANTIMICROBIAL AGENTS

Bogislav von Schmeling, Hamden, Conn., and Walter R. Boos, Guelph, Canada, assignors to Uniroyal, Inc., New York, N.Y. and Uniroyal Ltd., Ontario, Canada

Division of Ser. No. 806,650, Jun. 15, 1977, Pat. No. 4,130,664, which is a division of Ser. No. 658,4,004, Feb. 13, 1976, Pat. No. 4,044,139, which is a division of Ser. No. 440,941, Feb. 8, 1974, Pat. No. 3,954,868, which is a division of Ser. No. 231,385, Mar. 2, 1972, Pat. No. 3,808,316. This application Oct. 24, 1978, Ser. No. 954,265

Int. Cl.[2] **A01N** *9/20;* **C07C** *87/29*

U.S. Cl. 424—330 **6 Claims**

1. 1,3-Bis(alpha-aminobenzyl)benzene.

2. A bactericidal or fungicidal composition comprising the compound of claim **1**, in bactericidally or fungicidally effective amount, in admixture with a carrier therefor.

3. 1,4-Bis(4-methoxy-alpha-aminobenzyl)benzene.

4,202,905

LUMINOUS MATERIAL FOR USE IN FISHERY AND METHOD FOR THE PRODUCTION THEREOF

Yoshiyuki Asai, Yokohama; Nobuyoshi Makiguchi, Fujsawa; Masanobu Arita; Mitsuyoshi Nakamura, both of Kamakura, and Kozo Sasa, Yokohama, all of Japan, assignors to Mitsui Toatsu Chemicals Incorporated, Tokyo, Japan

Filed Feb. 22, 1978, Ser. No. 880,163

Int. Cl.[2] **A23L** *1/325*

U.S. Cl. 426—1 **11 Claims**

1. A method for the production of a luminous fishing article, comprising:

providing an aqueous solution containing a water-soluble polymer;

dispersing luminous bacteria in said solution; and

insolubilizing the polymer under conditions which maintain at least a part of the bacteria alive.

4,202,906

CHEWING GUM BASE CONTAINING A THERMALLY DECOMPOSED PRODUCT OF A NATURAL RUBBER AND A METHOD OF PREPARATION THEREOF

Koichi Ogawa, Tokyo; Shichigoro Tezuka, Hawasaki; Yoshinori Sato, Tokorozawa; Michio Moroe, Mitaka; Haruki Tsuruta, Yokohama, and Toshio Yoshida, Yokohama, all of Japan, assignors to Lotte Co., Ltd. and Takasago Perfumery Co., Ltd., both of Tokyo, Japan

Filed Oct. 5, 1978, Ser. No. 948,910

Claims priority, application Japan, Oct. 12, 1977, 52-121544

Int. Cl.[2] **A23G** *3/30*

U.S. Cl. 426—3 **9 Claims**

1. A chewing gum base consisting essentially of from 2 to 60% by weight of a natural rubber component and from 40 to 98% by weight of basic materials for the chewing gum, said natural rubber component being at least 60 parts by weight of a decomposition product obtained by thermally decomposing natural rubber at a temperature of from 200° to 350° C. in an inert atmosphere and the removing low boiling fractions having boiling points up to about 160° C. at a pressure of approximately 1 mmHg.

4,202,907

SAUSAGE PRODUCTS HAVING IMPROVED PHYSICAL PROPERTIES AND METHOD OF PRODUCING THE SAME

Arthur E. Poarch, 5104 Monterey St., Carmel, Calif. 93921

Continuation of Ser. No. 776,299, Mar. 10, 1977, abandoned. This application Jul. 24, 1978, Ser. No. 927,022

Int. Cl.[2] **A23C** *9/12, 9/14*

U.S. Cl. 426—34 **9 Claims**

1. Sausage and meatball products comprising cooked comminuted meat and fat and a gel formed by the reaction during the cooking of said products of enzymatically activated sodium caseinate and calcium ion, said gel being in an amount sufficient to retain fat and moisture within the body of the cooked product.

4,202,908

SYNTHETIC, GRANULAR FOOD CAVIAR AND METHOD OF PREPARING SAME

Alexandr N. Nesmeyanov; Sergei V. Rogozhin; Vladimir B. Tolstoguzov; Vladimir I. Misjurev; Vera A. Ershova, and Evgeny E. Braudo, all of Moscow, U.S.S.R., assignors to Institut Elementoorganicheskih Soedineny, Moscow, U.S.S.R.

Continuation of Ser. No. 668,788, Mar. 19, 1976, abandoned, which is a continuation-in-part of Ser. No. 563,202, Mar. 28, 1975, abandoned, and Ser. No. 563,205, Mar. 28, 1975, abandoned. This application May 17, 1978, Ser. No. 907,042

Int. Cl.[2] **A23J** *3/00*

U.S. Cl. 426—72 **45 Claims**

1. A synthetic, granular food caviar, the granules of which have a center of an aqueous jell of food gelatin containing additional edible protein surrounded by two coatings: the inner coating consisting essentially of the reaction product of said jell and vegetable tannins, and the outer coating being the reaction product of at least one edible polyvalent metal salt and acid polysaccharide.

4,202,909

TREATMENT OF WHEY

Harold T. Pederson, Jr., Livermore, Calif., assignor to Patent Technology, Inc., San Francisco, Calif.

Continuation-in-part of Ser. No. 744,082, Nov. 22, 1976, abandoned. This application May 19, 1978, Ser. No. 907,669

Int. Cl.[2] **A23C** *21/00*

U.S. Cl. 426—239 **6 Claims**

1. A process for the treatment of whey derived from the manufacture of cheese and having titratable acidity, the steps of subjecting the whey to membrane ultrafiltration to form a protein-rich fraction and a permeate fraction having a solids content of the order of 5.0 to 7.5% and having a lactose content of about 68 to 87%, a protein content of not more than about 6% and a mineral salt content, the mineral salt content including calcium and citrate salts together with phosphate and monovalent salts, precipitating calcium and citrate salts of the permeate without substantial precipitation of phosphate salts by concentrating the unneutralized permeate to a solids content of about 40 to 45%, and by holding the concentrate at a temperature level of about 180° to 200° F. for about 30 to 90 minutes to effect precipitation of calcium and citrate salts without substantial precipitation of phosphate salts, the precipitated salts being about 5.0 to 15.0% of the total mineral salts, removing the precpitated solids from the permeate, and then further concentrating the permeate and crystallizing and removing lactose from the same.

4,202,910

FILTRATION OF VEGETABLE BASED MATTER

Timothy G. Bradley, Denver, and Raymond L. McAdam, Littleton, both of Colo., assignors to Johns-Manville Corporation, Denver, Colo.

Division of Ser. No. 766,096, Feb. 7, 1977, Pat. No. 4,134,857.
This application Jul. 28, 1978, Ser. No. 929,057
Int. Cl.[2] C12H *1/00*; A23L *2/30*
U.S. Cl. 426—423 9 Claims

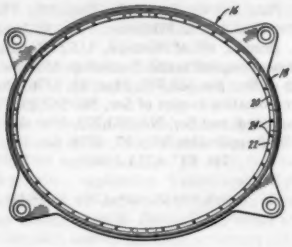
1. A method of producing a vegetable based beverage which comprises filtering said beverage through a filter aid comprising diatomite or perlite, said filter aid having had its initial content of beverage soluble iron reduced prior to such filtration by contacting the filter aid in granular form with tannic acid, gallic acid or mixtures thereof.

4,202,911

METHOD OF PREPARING POCKET PITA BREAD

Andre Papantoniou, and Kostas Papantoniou, both of Chicago, Ill., assignors to Pita Baking Company, Chicago, Ill.

Filed Jun. 8, 1978, Ser. No. 913,851
Int. Cl.[2] A21D *6/00, 8/02*; A21C *11/10*
U.S. Cl. 426—502 4 Claims



1. A method of preparing pita pocket bread from corresponding dough cut-outs and comprising, feeding a sheet of dough to a cutting sleeve, cutting the dough about a continuous periphery to separate a cut-out section while concurrently compressing a continuous, flat, narrow, flange about the periphery of the cut out section and, while cutting the dough, crimping the dough at spaced intervals inwardly and radially from the compressed flange, and concurrently applying mild pressure to the surface of the dough at intervals between the crimps; and thereafterwards baking in an oven the cut-out at a temperature and time to produce a pocket pita bread.

4,202,912

PROCESS FOR PRESERVING VEGETABLES USED TO MAKE KIMCHEE

Sunyong P. Kim, 535 N. Cahuenga Blvd., Los Angeles, Calif. 90004

Filed Oct. 30, 1978, Ser. No. 955,953
Int. Cl.[2] A23L *1/20*
U.S. Cl. 426—615 8 Claims

1. A process for preserving vegetables such as cabbages and radishes needed to prepare kimchee, said process including the steps of:

cutting up fresh vegetables into sizeable pieces;

washing the pieces of vegetables with water;

soaking the pieces of vegetables in salt water for a time period on the order of 15 to 20 minutes;

drying the pieces of vegetables of any excess moisture; and

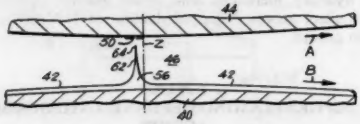
vacuum packaging the pieces of vegetables.

4,202,913

METHOD FOR LIQUID DEVELOPMENT OF LATENT ELECTROSTATIC IMAGES

Irving L. Klavan, Teaneck; Peter J. Calabrese, Maywood; Theron R. Finch, Northvale; Arthur Greenberg, all of Teaneck, N.J., and Robert P. McElroy, Spring Valley, N.Y., assignors to Philip A. Hunt Chemical Corp., Palisades Park, N.J.

Continuation-in-part of Ser. No. 676,463, Apr. 13, 1976, abandoned. This application Jun. 20, 1978, Ser. No. 916,042
Int. Cl.[2] G03G *13/10*
U.S. Cl. 430—106 34 Claims



1. A method for developing a latent electrostatically charged image on a member by passing the image-bearing member above and close to but out of contact with a surface of a liquid developer in the form of a continuous film at a development zone, the surface of the liquid developer at the development zone being spaced from the image-bearing member at the development zone, said film having a smooth surface prior to its approach to the development zone, the space between the latent image on the image-bearing member and the surface of the liquid developer at the development zone being between 4.5 and 40 mils, the liquid developer having a viscosity of 0.5 to 50 centipoises, a surface tension of 20 to 75 dynes/cm, and a density in order of 1 gram/cc, and the latent electrostatic image having a surface potential of at least 100 volts, portions of the surface of the liquid developer at the development zone opposed to charged segments of the image jetting toward the segments under the influence of the charges on the segments as pseudopods perpendicular to the film and to the image-bearing member, the liquid at the tips of such pseudopods reaching the charged segments, while liquid in any pseudopods formed in opposition to uncharged segments at the development zone is prevented from reaching the uncharged segments by the force of gravity.

4,202,914

METHOD OF DEPOSITING THIN FILMS OF SMALL DIMENSIONS UTILIZING SILICON NITRIDE LIFT-OFF MASK

Janos Havas, Hopewell Junction, and Gabor Paal, Fishkill, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 29, 1978, Ser. No. 974,461
Int. Cl.[2] B05D *3/06*
U.S. Cl. 427—38 15 Claims

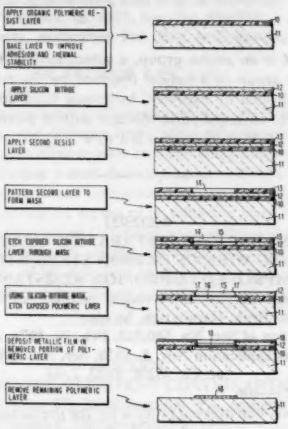
1. A lift-off method for forming a patterned film on a substrate comprising the steps of:

(a) forming on said substrate a first layer of organic polymeric material;

(b) forming on said first layer of organic polymeric material a layer of silicon nitride material having selected apertures therein;

(c) forming, by etching in a second gas ambient, apertures in said first organic polymeric material aligned with said apertures in said layer of silicon nitride material, said apertures in said first layer of organic polymeric material

extending beyond the edges of said apertures in said layer of silicon nitride material;


APPLY ORGANIC POLYMERIC RESIST LAYER
BAKE LAYER TO IMPROVE ADHESION AND THERMAL STABILITY
APPLY SILICON NITRIDE LAYER
APPLY SECOND RESIST LAYER
PATTERN SECOND LAYER TO FORM MASK
ETCH EXPOSED SILICON NITRIDE LAYER THROUGH MASK
USING SILICON NITRIDE MASK, ETCH EXPOSED POLYMERIC LAYER
DEPOSIT METALLIC FILM IN REMOVED PORTION OF POLYMERIC LAYER
REMOVE REMAINING POLYMERIC LAYER

(d) depositing a film layer onto said substrate through said aperture in said layer of silicon nitride; and

(e) removing said first layer of organic polymeric material.

4,202,915

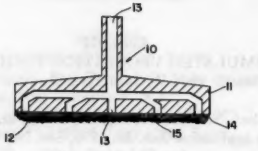
MECHANICAL PLATING PROCESS

Erith T. Clayton, Baltimore, Md., assignor to The Tainton Company, Baltimore, Md.

Filed Oct. 3, 1978, Ser. No. 948,230

Int. Cl.² C23C *17/00*

U.S. Cl. 427—47 **28 Claims**



1. A continuous method of mechanically applying a metal coating on a surface of an object comprising the steps of positioning a mechanical plating member adjacent the surface of an object to be plated, said plating member comprising a plurality of plating elements with void spaces separating the plating elements from one another, said void spaces forming reservoirs for particles of metal to be plated on said surface, providing a liquid medium having a pH of 1.6 to 3.5 and comprising an aqueous liquid carrier and solid metal plating particles in the reservoirs formed by said void spaces of said plating member and in contact with said surface to be plated, said metal particles present in said liquid medium being in the form of a plurality of flocculated masses, each floc comprising a lightweight aggregate of loosely held metal particles, said plating member being positioned relative to said object surface such that said plating elements are urged against said object surface, moving said plating member relative to said object surface in said relative position thereby subjecting said metal particles to mechanical energy sufficient to flatten and cold weld said metal particles to the object surface as a continuous adherent metal coating, and, while moving said plating member relatively to said object surface, providing an additional quantity of said liquid medium in said reservoirs and in contact with said surface to be plated to build up a continuous adherent metallic coating on said surface.

4,202,916

SURFACING PROCESS FOR THE STABILIZATION OF SEMICONDUCTOR BODIES EMPLOYING GLASS CONTAINING QUARTZ PASSIVATING LAYER

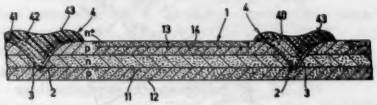
Madan M. Chadda, Nurmberg-Gaulnhofen, Fed. Rep. of Germany, assignor to Semikron Gesellschaft für Gleichrichterbau und Elektronik m.b.H, Nuremberg, Fed. Rep. of Germany

Filed Aug. 25, 1978, Ser. No. 936,885

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1977, 2739762

Int. Cl.² H01L *21/473*

U.S. Cl. 427—82 **14 Claims**



1. In a surfacing process for the stabilization of semiconductor wafers in which a glass coating is provided on the surface of the semiconductor at least in the region where a pn junction thereof extends to the surface, the improvement wherein the glass coating is provided by: directly forming on the surface of said semiconductor a layer of the oxide of the semiconductor material; forming on said semiconductor oxide layer, by melting, a base layer composed of a common glass having a thermal coefficient of expansion matched to that of said semiconductor material; and forming on said base layer a terminating layer of a glass containing quartz which has a thermal coefficient of expansion lower than that of said semiconductor material, by melting said quartz-containing glass at a temperature in a higher temperature range adjacent that required for melting the glass of said base layer.

4,202,917

METHOD FOR MANUFACTURE OF INDIUM OXIDE (III) FILM

Eiichi Ishii, Toyonaka; Masanori Nakane, Takatsuki; Hiroshi Ishikawa; Itsuki Uehara, both of Ikeda, and Yoshizo Miyake, Toyonaka, all of Japan, assignors to Agency of Industrial Science & Technology, Ministry of International Trade & Industry, Tokyo, Japan

Filed Mar. 7, 1979, Ser. No. 18,260

Claims priority, application Japan, Mar. 31, 1978, 53-38663

Int. Cl.² B05B *5/00*; B05D *3/02*

U.S. Cl. 427—161 **5 Claims**

1. A method for the production of an indium oxide (III) film on the surface of a given substrate, which method comprises first forming an indium oxide (I) film on the surface of the substrate and subsequently oxidizing this indium oxide (I) film.

4,202,918

METHOD FOR OBTAINING BRIGHT FINISH GALVANIZING COATING ON WIRE

William L. James, and Alex P. Wonso, both of Homewood, Ill., assignors to Fennell Corporation, Harvey, Ill.

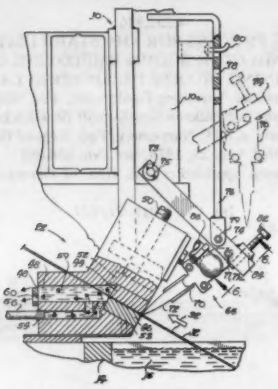
Division of Ser. No. 910,185, May 30, 1978. This application Mar. 7, 1979, Ser. No. 18,302

Int. Cl.² C23C *1/02*

U.S. Cl. 427—224 **2 Claims**

1. A method for obtaining a bright finish on a galvanized wire, comprising : quenching the wire while the zinc coating is still in a molten condition, including passing molten zinc coated wire through a water quenching bath substantially immediately following passage of the wire through a molten zinc galvanizing bath while substantially preventing water from said water quenching bath from leaking into the zinc

bath, and heating the zinc coated wire by passing the wire through the flame of a burner intermediate the zinc bath and



water quenching bath for maintaining the zinc coating in a molten condition until the wire enters the water quenching bath.

4,202,919

PROCESS FOR MANUFACTURING PROTEIN-CONTAINING ARTIFICIAL LEATHER

Margherita Cavallo, Monfalcone, Italy, assignor to Establissement Chemiaro, Mauren, Liechtenstein

Continuation of Ser. No. 768,870, Feb. 15, 1977, abandoned. This application May 3, 1978, Ser. No. 902,368

Claims priority, application Switzerland, Feb. 20, 1976, 2139/76

Int. Cl.[2] **B05D** *5/00, 3/02;* **B32B** *27/40*

U.S. Cl. 427—245 **12 Claims**

1. A process for manufacturing artificial leather from animal waste, comprising the following steps;

(a) preparing a colloidal solution of a protein substance of collagenic origin by water solvating limed, but neutralised, untanned tannery flesh, slaughterhouse waste or mixtures thereof in hot water;

(b) deeply soaking a synthetic support of good porosity, and of known type, with said solution of collagenic substance, and condensing and cross-linking said collagenic substance on the synthetic support fibres by the simple action of cross-linking agents; and

(c) tanning the support thus soaked by using the known tanning processes of natural hide tanning technology.

4,202,920

CYANOACETIC ACID DERIVATIVES AS EPOXY RESIN CURING AGENTS

Alfred Renner, Münchenstein, and Werner Margotte, Lupsingen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

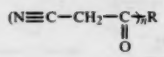
Filed Oct. 24, 1978, Ser. No. 954,945

Claims priority, application Switzerland, Oct. 25, 1977, 12966/77

Int. Cl.[2] **C08G** *59/40, 59/44;* **C08L** *63/00*

U.S. Cl. 427—386 **22 Claims**

1. A process for the production of a cured shaped article, based on epoxide resins, which comprises reacting at elevated temperature an epoxide resin with a curing agent selected from the group consisting of cyanoacetonitrile or a compound of the formula (I)



(I)

wherein R is an amino group, a substituted or unsubstituted hydrazino group or a radical obtained by the removal of an amine hydrogen or hydroxyl hydrogen from an amine or a monohydric to tetrahydric alcohol with a partial molecular weight of 2,000 or less and n is 1 to 4.

4,202,921

PROCESS FOR THE PREPARATION OF ROPE AND SPRING WIRE OF CARBON STEEL WITH AN IMPROVED CORROSION RESISTANCE

Per Enghag, Garphyttan, Sweden, assignor to Aktiebolaget Garphytte Bruk, Garphyttan, Sweden

Continuation of Ser. No. 660,923, Feb. 24, 1976, abandoned. This application Nov. 8, 1978, Ser. No. 958,546

Int. Cl.[2] **C23C** *1/02, 1/04*

U.S. Cl. 427—406 **3 Claims**

1. In a two-step dipping process for the preparation of corrosion-resistant carbon steel wire the first step of which (melt No. 1) is a conventional hot-dip galvanizing in a first bath of zinc, the improved second step which comprises treating the wire from the first bath in a second bath of a molten alloy composition (melt No. 2) consisting essentially of 2 to 40% by weight of zinc and at least one of the alloying elements of the group consisting of Sn, Cd, Al, Pb, Cu, Si, and Ni, at least one of the alloying elements Sn and Cd being present in said alloy composition, at a temperature of not less than 30° C. and not more than 75° C. above the liquidus temperature for the alloy composition of said second bath, and wherein the alloying elements Pb, Cu, Ni, and Si may be present in amounts ranging up to 10%, 2%, 2%, and 0.10% by weight respectively.

4,202,922

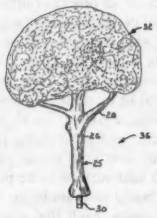
SIMULATED VEGETATION PRODUCT

David L. Osment, 9904 W. 70th Ter., Shawnee Mission, Kans. 66203

Division of Ser. No. 611,903, Sep. 10, 1975, Pat. No. 4,082,586. This application Jan. 23, 1978, Ser. No. 871,392

Int. Cl.[2] **A41G** *1/00*

U.S. Cl. 428—18 **3 Claims**



1. A simulated vegetation product comprising:

a layer of non-ferrous, light-penetrable, fibrous substrate, said substrate being characterized by the ability to be pulled and stretched over the limbs of an artificial tree structure;

and

a non-ferrous, leaf-simulating material comprising ground rubber-like foam particles partially covering and adhered to said substrate.

4,202,923

DRAWING LAYER FOR PLASTIC FILMS

Klaus Thoese, Wiesbaden, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 15, 1977, Ser. No. 860,850

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1976, 2656925

Int. Cl.[2] B32B *1/00, 3/00*

U.S. Cl. 428—144 5 Claims

1. In a drawing layer for a plastic film, in particular for a polyester film, said drawing layer being adherent to the film and comprising a cellulose ester crosslinked by a formaldehyde resin, and including a matt-finishing agent and/or a pigment, the improvement which comprises that the drawing layer is adherent to the film by means of an adhesive layer composed of polymeric material, said drawing layer additionally containing about 5 to 50% by weight, based on the weight of the cellulose ester, of at least one copolymer containing maleic anhydride units having unchanged anhydride groups.

4,202,924

HIGH IMPACT RESISTANT COATED ARTICLES

Walter G. De Witt, III, Southhampton, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 352,157, Apr. 18, 1973, abandoned. This application Oct. 20, 1977, Ser. No. 844,012

Int. Cl.[2] B32B *3/00, 7/14*

U.S. Cl. 428—201 4 Claims

1. A wood, metal or plastic substrate coated with the composition comprising an acrylic solution polymer polymerized from a monomer system comprising one or more lower alkyl methacrylates and acrylates and having a molecular weight of about 30,000 to 250,000 and a Tg above 65° F., a solvent therefor, and a compatible acrylic polymer having a Tg less than −20° F. comprising a poly(butyl acrylate), wherein the weight ratio of said acrylic solution polymer to said compatible acrylic polymer is about 10:1 to 1:10.

4,202,925

PAPER SURGICAL TAPE

Winifred C. Dabroski, East Brunswick, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed Apr. 4, 1978, Ser. No. 893,373

Int. Cl.[2] B32B *7/00;* C09J *7/02*

U.S. Cl. 428—219 10 Claims

1. A surgical adhesive tape which includes a pressure sensitive adhesive mass coated on one side of a saturated paper, said paper (1) being saturated with from 20 to 75 parts per hundred parts paper of an acrylic polymer having a T_g of less than 20° C., and (2) comprising a mixture of randomly dispersed woodpulp and thermoplastic fibers, said woodpulp comprising from about 10 to 75% by weight of the paper, and said woodpulp and thermoplastic fibers ranging in length, on the average, from about $\frac{1}{4}$ to $\frac{3}{4}$ of an inch and said thermoplastic fibers being selected from the group consisting of polyamide, polyester, polypropylene and polyethylene fibers and a backsize coated on the other side of said paper.

4,202,926

POLYMER CURING SYSTEM

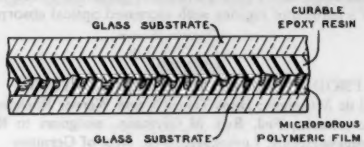
Rostyslaw Dowbenko, Gibsonia, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 347,985, Apr. 4, 1973, Pat. No. 3,907,623. This application Jun. 13, 1975, Ser. No. 586,824

Int. Cl.[2] B32B *3/26, 5/18*

U.S. Cl. 428—304 9 Claims

1. A polymeric film containing a plurality of open, discrete voids, said voids having located therein a polymer curing agent.



9. An adhesive bonding system according to claim 8 wherein said microporous polymeric film comprises an epoxy resin.

4,202,927

MAGNETIC RECORDING MEDIUM

Nobutaka Yamaguchi; Satoru Takayama, and Masaki Fujiyama, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Continuation of Ser. No. 836,710, Sep. 26, 1977, abandoned. This application Sep. 25, 1978, Ser. No. 945,258

Claims priority, application Japan, Sep. 29, 1976, 51-116026

Int. Cl.[2] H01F *10/00*

U.S. Cl. 428—323 12 Claims

1. A magnetic recording medium consisting of a support base having a surface roughness of at most 0.33 micron;

a magnetic recording layer having a Young's modulus of at least 5×10^{10} dyne/cm^2 and being provided on one side of the base; and

a back-coating layer provided on the other side of the base in an amount of 0.2 to 500 mg/m^2, said back-coating layer consisting of a quaternary ammonium salt represented by the general formula:

$$[R_1R_2R_3R_4N]^+X^-$$

wherein

$R_1=R_2=$H, CH_3, C_2H_5, C_3H_7, C_4H_9 or

$R_3=-CH_2CH_2OH$ or $-CH_2CH_2CH_2OH$;

$R_4=C_nH_{2n+1}CONH(C_mH_{2m})-$ or

$C_nF_{2n+1}CONH(C_mH_{2m})-$

wherein n=6–24 and m=2–6; and

X=F, Cl, Br, I, $\frac{1}{2}SO_4$, NO_3, NO_2, ClO_4 or CrO_3.

4,202,928

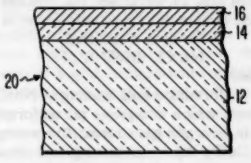
UPDATEABLE OPTICAL STORAGE MEDIUM

David L. Staebler, Lawrenceville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jul. 24, 1978, Ser. No. 927,514

Int. Cl.[2] B32B *17/06;* G01D *15/34*

U.S. Cl. 428—446 12 Claims



1. In an optical storage medium comprising a transparent substrate and a light sensitive layer overlying said substrate, the improvement wherein the light sensitive layer is a layer of

amorphous silicon between about 500 angstroms and 5000 angstroms thick which is deposited onto said substrate from a glow discharge and which contains information stored in the form of a pattern of regions with increased optical absorption.

4,202,929
PRODUCTION OF NON-STICK COATINGS

Armand de Montigny; Hans Toepsch, and Werner Büchner, all of Leverkusen, Fed. Rep. of Germany, assignors to Bayer Atkiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 6, 1978, Ser. No. 949,316

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1977, 2748421

Int. Cl.[2] C08G *47/02;* B32B *9/04*

U.S. Cl. 428—452 **3 Claims**

1. In the production of a coated thin substrate having a reduced tendency to adhere by applying to the substrate a solvent-containing mixture comprising (A) an α,ω-polyorganosiloxanediol, (B) an organosiloxane containing Si-H groups, (C) an alkyl- or alkenyl-triacetoxysiloxane, (D) an organic isocyanate with more than two isocyanate radicals and (E) a hardening catalyst, and then heating the substrate to harden the coating, the improvement which comprises including in the mixture applied to the substrate a reaction product (F) of a chloromethylpolymethylsiloxane of the formula

$$ClCH_2(CH_3)_2Si[OSi(CH_3)CH_2Cl]_nOSi(CH_3)_2Cl$$

wherein n is from 2–about 200, with at most an equivalent molar amount of a primary alkyl, alkenyl or cycloalkyl amine with about 4–18 carbon atoms.

4,202,930
LANTHANUM INDIUM GALLIUM GARNETS

Milan R. Kokta, San Diego, Calif.; Robert C. Linares, Warren Township, Somerset County, and Michael A. Di Giuseppe, Succasunna, both of N.J., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 876,820, Feb. 10, 1978, abandoned. This application Sep. 13, 1978, Ser. No. 941,891

Int. Cl.[2] C04B *35/40;* H01F *1/00;* C01F *17/00*

U.S. Cl. 428—539 **7 Claims**

1. A congruently melting composition of a lanthanum indium gallium garnet having the formula

$$La_aIn_bGa_cO_{12}$$

where "a" ranges from greater than about 3.24 to less than 3.32, "b" ranges from greater than about 1.84 to less than about 2.24 and "c" ranges from greater than about 2.48 to less than about 2.88, the total "a" plus "b" plus "c" being 8.

4,202,931
SUPERCONDUCTING ARTICLES OF MANUFACTURE AND METHOD OF PRODUCING SAME

Lawrence R. Newkirk, Los Alamos, and Flavio A. Valencia, Santa Fe, both of N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

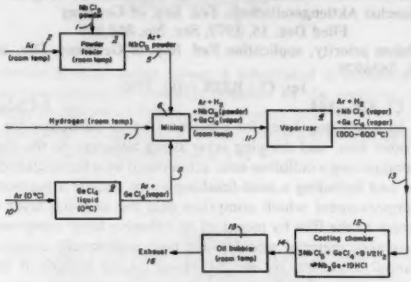
Filed Sep. 23, 1974, Ser. No. 508,586

The portion of the term of this patent subsequent to Feb. 1, 1994, has been disclaimed.

Int. Cl.[2] B05D *5/12*

U.S. Cl. 428—662 **8 Claims**

1. A process for forming a bulk coating of Nb_3Ge bonded to a copper substrate which comprises (a) uniformly entraining $NbCl_5$ powder in an argon gas stream, (b) forming a stream of argon gas and $GeCl_4$ vapor, (c) mixing said streams together and with hydrogen in a molar ratio which on the coreduction of said $NbCl_5$ and $GeCl_4$ by said hydrogen produces Nb_3Ge, (d) heating the resulting gas mixture containing said entrained $NbCl_5$ powder to a temperature of 400° to 600° C., (e) flowing the resulting heated gas-vapor mixture over said copper substrate, and (f) heating said copper substrate and said gas-vapor


Nb Cl5 powder
Ar (room temp)
Powder feeder (room temp)
Ar + NbCl5 powder
Hydrogen (room temp)
Mixing
(room temp)
Vaporizer
Ar + H2 + NbCl5 (powder) + GeCl4 (vapor)
Ar + H2 + Nb Cl5 (vapor) + Ge Cl4 (vapor) (600–900 °C)
Ar (0 °C)
GeCl4 liquid (0°C)
Ar + GeCl4 (vapor)
Exhaust
Oil bubbler (room temp)
Coating chamber
3 Nb Cl5 + GeCl4 + 9 VH2 → Nb3Ge + 10 HCl

mixture to a temperature greater than 650° C. to chemically vapor deposit Nb_3Ge on said copper substrate.

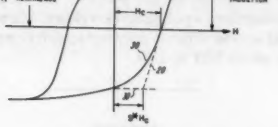
4,202,932
MAGNETIC RECORDING MEDIUM

Tu Chen, Saratoga, and George B. Charlan, San Jose, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 927,068, Jul. 21, 1978. This application Oct. 16, 1978, Ser. No. 952,023

Int. Cl.[2] G11B *7/24;* H01F *1/06;* B32B *15/04*

U.S. Cl. 428—667 **6 Claims**



1. A magnetic recording medium of relatively magnetically isotropic thin metallic film on a support, said film comprising a metallic alloy of cobalt and either rhenium, ruthenium or osmium or an admixture thereof.

4,202,933
METHOD FOR REDUCING FUEL CELL OUTPUT VOLTAGE TO PERMIT LOW POWER OPERATION

Carl A. Reiser, Glastonbury, and Michael B. Landau, West Hartford, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Oct. 13, 1978, Ser. No. 951,421

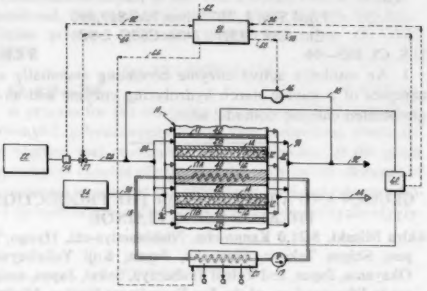
Int. Cl.[2] H01M *8/04*

U.S. Cl. 429—13 **6 Claims**

1. In a method for permitting the lowering of the power output of a plurality of fuel cells when the average cell voltage at a present actual power output is at the maximum permitted, wherein the fuel cells are connected electrically in series and each cell includes an anode and a cathode wherein air as the oxidant is fed to the cathodes via a common manifold and hydrogen as the fuel is fed to the anodes and both the anode and cathode exhaust streams are continuously vented, and wherein means is provided to recycle a portion of the cathode exhaust stream to the cathodes, the steps of:

(1) comparing the desired power output to the actual power output and, if the desired power output is less than the actual power output, increasing the cathode exhaust stream recycle rate to lower the average cell voltage;

(2) decreasing the actual power output until the desired power output or the maximum permitted voltage is reached, whichever occurs first;
(3) comparing again the desired power output to the actual power output and, if the desired power output is still less



than the actual power output, increasing the oxygen utilization of the cells by decreasing the rate of air flow to the cells to lower the average cell voltage; and
(4) repeating steps (2) and (3) until either the actual power output equals the desired power output or until a maximum allowable oxygen utilization is reached.

4,202,934

NOBLE METAL/VANADIUM ALLOY CATALYST AND METHOD FOR MAKING

Vinod M. Jalan, Manchester, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Jul. 3, 1978, Ser. No. 922,005
Int. Cl.[2] H01M *4/86*
U.S. Cl. 429—40 **28 Claims**

1. A method for making a finely divided alloy of noble metal and vanadium comprising the steps of:
reacting an aqueous solution of a vanadium compound with sodium dithionite to form a sol of a finely dispersed vanadium sulfite complex; and
reacting finely divided unalloyed noble metal particles with said complex by intimately contacting the noble metal particles with the complex and heating to a sufficiently high temperature in at least a locally reducing environment to thermocatalytically reduce said complex and at the same time form a finely divided alloy of the noble metal and vanadium.

22. An electrochemical cell comprising a cathode electrode, said electrode including a catalyst comprising a noble metal-vanadium alloy, said alloy having a catalytic activity for the reduction of oxygen greater than the catalytic activity of the noble metal in unalloyed form, said cell including phosphoric acid electrolyte.

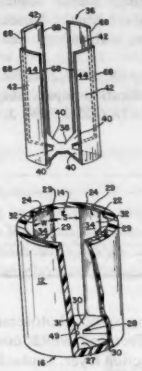
4,202,935

DEFERRED ACTION DRY CELL BATTERY

Alexander R. Malcolm, Five Hamiltonian Apartments, Middlesex, N.J. 08846

Filed Apr. 23, 1979, Ser. No. 32,358
Int. Cl.[2] H01M *6/00*
U.S. Cl. 429—48 **21 Claims**

1. A battery, comprising:
a casing;
a pair of electrode means positioned within said casing, said electrode means being spaced from each other so as to form a chamber therebetween;
an electrolyte contained in said chamber; and
shield means movable relative to one of said electrode means for shielding said one electrode means from said electrolyte when said shield means is in a first position relative to said one electrode means and for exposing said one electrode means to said electrolyte when said shield means is in a second position relative to said one electrode means, said shield means being permanently and completely



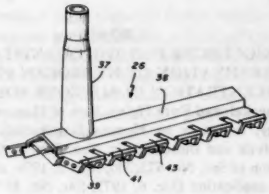
maintained within said chamber during the movement of said shield means from said first position to said second position.

4,202,936

STORAGE BATTERIES OF THE LEAD-ACID CLASS AND METHODS OF MAKING AND OPERATING SAME

Roy A. Guimond, Holden; Nanci W. Reed, Sudbury, and John E. Gulliksen, Shrewsbury, all of Mass., assignors to Koehler Manufacturing Company, Marlborough, Mass.

Filed Oct. 10, 1978, Ser. No. 949,890
Int. Cl.[2] H01M *2/00*
U.S. Cl. 429—163 **18 Claims**



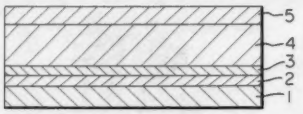
1. In a storage battery of the lead-acid class including positive and negative plate means having respective grid structures, the grid structure of the positive plate means comprising a top bar, post means, and a plurality of spaced apart current collecting spines joined to the top bar, active material, retaining means for locating the active material around the spines, and said positive and negative plate means being supported in an electrolyte body within a container, that improvement which consists of a grid complement formed of a chemically inert material impermeable to the electrolyte, said grid complement having a top bar enclosure, a sleeve portion, and spine-engaging portions formed integrally with the top bar enclosure, and said top bar enclosure and spine-engaging portions comprising depending parts arranged to extend around the top bar and portions of the said spines at their points of joinder with the top bar thereby to overlie positive grid surfaces which are not in contact with the active material.

4,202,937

ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEMBER HAVING NO FATIGUE EFFECT

Tadaji Fukuda, Toride; Isamu Kajita, Yokohama; Teruo Misumi, Toride; Hideyo Kondo, Toride, and Nobuo Kitajima, Toride, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 18, 1977, Ser. No. 797,817
Claims priority, application Japan, May 27, 1976, 51-62134
Int. Cl.[2] G03G *5/08, 5/082*
U.S. Cl. 430—58 14 Claims



1. An electrophotographic photosensitive member which exhibits no fatigue effect and which comprises an inorganic crystalline charge injection layer, a subsidiary charge injection layer overlaid on and in electrical contact with said charge injection layer, a photoconductive layer overlaid on and in electrical contact with said subsidiary charge injection layer and an electrically insulating layer overlaid on said photoconductive layer; said subsidiary charge injection layer being composed of an amorphous semiconductor selected from the group consisting of Se and Se-containing alloys, having a lower free charge density than that of said photoconductive layer and being able to make it easy to inject an amount of electric charge from the charge injection layer into the photoconductive layer; said charge injection layer having a higher free charge density and a lower dark resistance than those of said photoconductive layer, having a maximum dark resistance of 1×10 ohm-cm and serving as a main supply source of the electric charge to be injected into the photoconductive layer; and said photoconductive layer being composed of an amorphous semiconductor selected from the group consisting of Se and Se-containing alloys.

4,202,938

PROCEDURE FOR THE QUANTITATIVE DETERMINATION OF HYDROGEN PEROXIDE CONCENTRATION IN AQUEOUS SOLUTIONS

Rainer Haeckel, and Fritz Heinz, both of Hanover, Fed. Rep. of Germany, assignors to Human Gesellschaft mbH für Biotopanalytic und Biotopschutz, Fed. Rep. of Germany

Continuation of Ser. No. 673,700, Apr. 5, 1976, abandoned. This application Dec. 6, 1977, Ser. No. 857,907
Int. Cl.[2] G01N *31/14*
U.S. Cl. 435—10 7 Claims

1. In a procedure for the rapid quantitative determination of hydrogen peroxide concentration in a biological medium in an aqueous solution containing other substances which occasionally or frequently cause interference reactions, a process for accurately making such determination without encountering such interference, which process comprises (a) reacting the hydrogen peroxide in the aqueous solution in the presence of the catalyst catalase with ethanol in a manner to cause the formation of acetaldehyde, (b) simultaneously in the same reaction medium reacting the latter in the presence of an aldehyde dehydrogenase as a catalyst, with the oxidized form of nicotinamide-adenine-dinucleotide (NAD) or nicotinamide-adenine-dinucleotide-phosphate (NADP) in a manner to reduce said oxidized form to produce a reduced form identifiable as NADH or NADPH, and (c) determining the concentration of said reduced form in said biological medium aqueous solution.

4,202,939

GLUCOAMYLASE IMMOBILIZED ON CATIONIC COLLOIDAL SILICA

Nancy J. Mueller, Lyons, and Dennis J. Holik, Naperville, both of Ill., assignors to CPC International Inc., Englewood Cliffs, N.J.

Filed Sep. 1, 1977, Ser. No. 829,690
Int. Cl.[2] C12D *13/04;* C07G *7/02*
U.S. Cl. 435—96 8 Claims

1. An insoluble active enzyme consisting essentially of a complex of a soluble starch hydrolyzing enzyme and an agglomerated cationic colloidal silica.

4,202,940

GLUCAN AND A PROCESS FOR THE PRODUCTION THEREOF USING ELSINOE

Akira Misaki, 5-21,0 Kanno-cho, Nishinomiya-shi, Hyogo, Japan; Shigeo Takaya, Shizuoka, Japan; Koji Yokobayashi, Okayama, Japan, and Yoichi Tsuburaya, Sakai, Japan, assignors to Director-Gen. of the Tea Experiment Station, Ministry of Agriculture and Forestry Japanese Government, Shizuoka; Misaki, Akira and Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo, Okayama, all of, Japan

Division of Ser. No. 864,015, Dec. 23, 1977. This application Sep. 21, 1978, Ser. No. 944,302
Claims priority, application Japan, Dec. 31, 1976, 51/157935
Int. Cl.[2] C12P *19/04;* C12R *1/645*
U.S. Cl. 435—101 2 Claims

1. A process for producing elsinan, a glucan consisting essentially of repeating units of [3)—Glc—(4→4)—Glc—(1→4)—Glc—(1→] (wherein Glc represents alpha-D-glucopyranose residue), comprising cultivating microorganisms of genus Elsinoe, capable of producing the elsinan on a nutrient medium containing sucrose to produce the elsinan, and separating and recovering the elsinan therefrom.

4,202,941

GLYCEROL OXIDASE AND PROCESS FOR THE PRODUCTION THEREOF AND METHOD FOR THE QUANTITATIVE DETERMINATION OF GLYCEROL BY GLYCEROL OXIDASE

Osamu Terada; Takayuki Uwajima; Akira Mihara; Kazuo Aisaka, all of Machida; Hiroko Akita, Yokohama; Toshiaki Nagai, and Yoshiaki Shimizu, both of Sunto, all of Japan, assignors to Kyowa Hakko Kogyo, Co. Ltd., Japan

Filed Apr. 19, 1978, Ser. No. 897,695
Claims priority, application Japan, Apr. 19, 1977, 52-44146
Int. Cl.[2] C07G *7/028;* G01N *31/14*
U.S. Cl. 435—190 9 Claims

1. Glycerol oxidase characterized by its ability to oxidize glycerol in the presence of oxygen to form hydrogen peroxide and glyceraldehyde.

4,202,942

DESTRUCTION BY FERMENTATION OF 2-KETOGLUCONATE IN THE PRESENCE OF 2-KETOGULONATE

Donald A. Kita, Essex; John W. Gagne, Norwich, and Dennis M. Fenton, Gales Ferry, all of Conn., assignors to Pfizer Inc., New York, N.Y.

Filed Jul. 20, 1978, Ser. No. 926,262
Int. Cl.[2] C12B *1/00*
U.S. Cl. 435—262 2 Claims

1. A process for destroying 2-ketogluconate in a mixture containing 2-ketogulonate and said 2-ketogluconate which comprises contacting said mixture with a growing culture of *Pseudomonas fluorescens strain ATCC* 13430 in an aqueous nutrient medium and continuing the fermentation until said 2-ketogluconate is substantially destroyed.

4,202,943

RESOLUTION OF A RACEMATE

Yasuji Suhara; Hiromi Maruyama, both of Yokohama; Sayuri Itoh, Yokosuka, and Kazuteru Yokose, Urayasu, all of Japan, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 839,525, Oct. 5, 1977, abandoned. This application Jul. 12, 1978, Ser. No. 923,842

Claims priority, application Switzerland, Oct. 12, 1976, 12875/76

Int. Cl.[2] **C12P** *13/04*

U.S. Cl. 435—280 **9 Claims**

1. A process for the resolution of racemic DL-N-benzyloxycarbonyl-2-(p-hydroxyphenyl)-glycine comprising enzymatically treating said racemate with Actinomycete of the genus Streptomyces capable of effecting the asymmetric cleavage of this racemate to convert the racemte to D-N-benzyloxycarbonyl-2-(p-hydroxyphenyl)-glycine and L-p-hydroxyphenlyglycine.

4,202,944

SELECTIVE ION EXCHANGE RESINS WITH PYRIDYL-IMIDAZOLYL CHELATING FUNCTIONAL GROUPS

Robert D. Hancock, Germiston; Roy F. Bond, Johannesburg, and Brian R. Green, Weltevreden Park Extension 9, all of South Africa, assignors to National Institute for Metallurgy, Randburg, South Africa

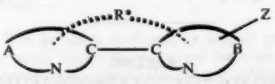
Filed Sep. 7, 1978, Ser. No. 940,457

Claims priority, application South Africa, Sep. 7, 1977, 77/5398

Int. Cl.[2] **B01D** *15/04;* **C08F** *26/06*

U.S. Cl. 521—32 **7 Claims**

1. An ion exchange resin having functional groups of the formula:



wherein:

A and B, independently of each other, represent groups forming together with the attached carbon and nitrogen atoms, an optionally substituted five or six membered heterocyclic ring independent of each other and selected from the group consisting of optionally substituted pyridyl, imidazole and imidazolyl groups; R* may be totally absent or it may represent an optionally substituted alkyl radical and Z represents a resin to which the functional groups are attached.

4,202,945

PHENOLIC FOAM MATERIALS AND METHOD OF MAKING SAME

Franklyn J. Leinhardt, 1248 Wiltshire Rd., York, Pa. 17407

Filed Apr. 3, 1979, Ser. No. 26,664

Int. Cl.[2] **C08J** *9/14*

U.S. Cl. 521—121 **16 Claims**

1. A foamable composition for use in preparing foamed phenolic materials comprised of a water soluble phenol-formaldehyde resole, an acid catalyst, a foaming agent mixture containing a low boiling fluorocarbon, a surface active agent and an aliphatic polyhydric alcohol, and a cell structure control agent comprised of from about 12 to 15% water soluble inorganic salt and about 10 to 15% ammonium lignin sulfonate, both by weight relative to the weight of said phenol-formaldehyde resole.

4,202,946

FIRE RETARDANT POLYURETHANES PREPARED FROM HYDROXY SUBSTITUTED AMINOMETHANEPHOSPHONATES

Curtis P. Smith, Cheshire, and Henri Ulrich, Northford, both of Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 786,690, Apr. 11, 1977, Pat. No. 4,112,014, which is a continuation of Ser. No. 634,136, Nov. 21, 1975, abandoned. This application Jun. 28, 1978, Ser. No. 919,962

Int. Cl.[2] **C08G** *18/14*

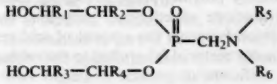
U.S. Cl. 521—169 **5 Claims**

1. A fire retardant polyurethane which comprises the product of reaction of

(i) an organic polyisocyanate;

(ii) a polyol having an equivalent weight from about 90 to about 2000 and a functionality of from 2 to 6; and

(iii) an O,O'-bis(hydroxyalkyl) N,N-di(lower-alkyl-)aminomethanephosphonate having the following formula :



wherein R_1, R_2, R_3, and R_4 are each independently selected from the class consisting of hydrogen and lower-alkyl, and R_5 and R_6 each independently represent lower-alkyl.

4,202,947

POLYURETHANE FOAM PREPARED FROM GRAFT COPOLYMERS OF VINYL MONOMERS AND UNSATURATED POLYOLS CONTAINING ALKENYL ARYL CONSTITUENTS

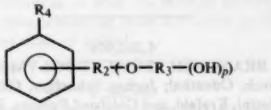
Frank J. Preston, Madison, and Kiran B. Chandalia, Cheshire, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Division of Ser. No. 783,354, Mar. 31, 1977, Pat. No. 4,140,667. This application Nov. 13, 1978, Ser. No. 960,365

Int. Cl.[2] **C08G** *18/14*

U.S. Cl. 521—174 **19 Claims**

1. In a polyurethane foam prepared from a reaction mixture comprising an organic polyisocyanate, a foaming agent, and a polyol reactant, the improvement comprising preparing said foam using a polyol reactant comprising a graft copolymer prepared by polymerizing an ethylenically unsaturated monomer or a mixture of such monomers in a polyol comprising an alkenyl aryl polyol of the formula:



wherein:

R_4 represents straight or branched chain alkenyl of 2 to 10 carbons;

R_2 represents lower alkyl of 1 to 4 carbons, or

where u is an integer from 0 to 3;

p is an integer from 2 to 5; and —O—R_3—$(OH)_p$) represents a residue of a polyether or polyester polyol, $R_3(OH)_{p+1}$, wherein R_3 represents a polyether or polyester chain, said polyol having an average equivalent weight ranging from

about 250 to 5000, after removal of one hydroxy hydrogen therefrom.

4,202,948

IMPACT-RESISTANT THERMOPLASTIC COMPOSITION BASED ON GRAFT COPOLYMER

Warren J. Peascoe, Woodbridge, Conn., assignor to Uniroyal, Inc., New York, N.Y.

Filed Sep. 26, 1977, Ser. No. 836,643

Int. Cl.[2] C08L *51/06*

U.S. Cl. 525—70 **2 Claims**

1. A thermoplastic graft copolymer composition characterized by high impact strength and high resistance to failure from flexing comprising a blend of two separately prepared copolymer compositions (A) and (B);

(A) being a soft, rubbery graft copolymer formed by simultaneous graft copolymerization of:

(a) monoethylenically unsaturated resin-forming monomeric material; and

(b) a rubbery polymer spine consisting essentially of a copolymerizate of ethylene, propylene and 5-ethylidene-2-norobornene, the amount of said resin-forming monomeric material (a) grafted to the rubbery spine (b) being sufficient to provide a weight ratio of grafted resin to rubbery spine of at least 0.2;

(B) being a resinous polymer separately prepared in the absence of the rubbery copolymer (b) by polymerization of monoethylenically unsaturated resin-forming monomeric material;

wherein:

the monomeric material (a) is a mixture of styrene and acrylonitrile in weight ratio of 80/20 to 65/35, the rubbery copolymer (b) is a terpolymer of ethylene, propylene and 5-ethylidene-2-norbornene in which the ratio of ethylene to propylene is within the range from 80/20 to 20/80, the Mooney viscosity of (b) is from 55 to 78 ML-4 at 257° F. and the iodine number of (b) is from 15 to 40, the amount of (a) being about 50% based on the weight of (a) plus (b), the separately prepared resin (B) is a copolymer of styrene and acrylonitrile in weight ratio of 80/20 to 65/35 having an intrinsic viscosity in dimethylformamide at 30° C. of at least 0.65, the amount of (B) in the blend being sufficient to provide an over-all ratio of resin to rubber in the range from 80/20 to 75/25, the said blend having a notched Izod impact strength greater than 5 foot-pounds per inch of notch, an average resistance to hand flexure greater than 2, an ultimate tensile strength of at least 3,600 psi, a Rockwell R hardness of about 85 to 105, a percent gloss of from about 20 to 95, and a die swell of about 1.23 to 1.52.

4,202,949

BRANCHED SEGMENT POLYMERS

Manfred Beck, Odenthal; Jochen Schnetger, Odenthal-Hoeffe; Volker Serini, Krefeld, and Gottfried Pampus, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

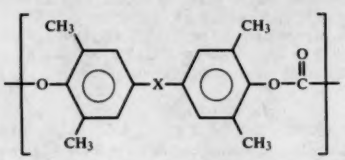
Filed Mar. 15, 1978, Ser. No. 886,814

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1977, 2712230

Int. Cl.[2] C08L *25/10, 69/00*

U.S. Cl. 525—92 **7 Claims**

1. A process for the preparation of a thermoplastic elastomer wherein 0.2–250 moles of an anion of a branched aromatic vinyl/diene block polymer having a vinyl block molecular weight of 5,000 to 500,000 and a diene block molecular weight of 10,000 to 1,000,000 is reacted per mole of an aromatic polycarbonate of molecule weight 10,000 to 200,000 or with a mixture of aromatic polycarbonates wherein at least 50% of the linear chains of the polycarbonate or mixture of polycarbonates consist of structural units corresponding to the Formula (1) having molecular weight 10,000 to 200,000



(1)

in which X represents a C_1–C_5-alkylene or C_1–C_5-alkylindene radical.

4,202,950

PROCESS FOR PREPARING POLYURETHANE ELASTOMERS

Gary L. Statton, Wallingford, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 646,119, Jan. 2, 1976, abandoned. This application Sep. 16, 1977, Ser. No. 833,950

Int. Cl.[2] C08L *75/00*

U.S. Cl. 525—123 **9 Claims**

1. A process of preparing polyurethane elastomers having improved physical properties comprising graft copolymerizing an ethylenically unsaturated monomer selected from the group consisting of styrene, esters of acrylic or methacrylic acid in which the alcohol portion of the ester contains 1 to 18 carbon atoms, vinyl esters and mixtures of these onto a liquid hydroxyl-containing butadiene polymer having a number average molecular weight of about 400 to 25,000 and 1.8 to 3 hydroxyl groups per molecule and reacting the resulting graft copolymer with a polyfunctional isocyanate at an isocyanate to total reactive hydrogen group ratio of about 0.8:1 to 1.5:1.

4,202,951

BRANCHED POLYPHENYLENE-POLYPHENYLENE SULFIDE BLENDS

Chen-Shen Wang, Naperville, Ill., and Sandra K. Koster, Aiken, S.C., assignors to Standard Oil Company of Indiana, Chicago, Ill.

Continuation of Ser. No. 736,388, Oct. 28, 1976, abandoned. This application Sep. 18, 1978, Ser. No. 943,573

Int. Cl.[2] C08L *65/02*

U.S. Cl. 525—416 **10 Claims**

1. A moldable blended polyphenylene composition exhibiting superior heat aging properties comprising about 40 to 99 wt. % branched polyphenylene containing at least 8 wt. % benzene ring structures which are at least trisubstituted and nonfused and about 1 to 60 wt. % polyphenylene sulfide.

4,202,952

METHOD OF VULCANIZING BROMOBUTYL RUBBER WITH AMINO ACIDS

Masao Onizawa, Kunitachi, Japan, assignor to Sanyo Trading Co., Ltd., Tokyo, Japan

Division of Ser. No. 625,874, Oct. 24, 1975, abandoned. This application Nov. 14, 1977, Ser. No. 851,590

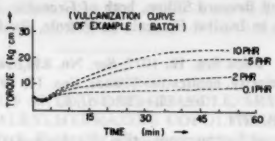
Claims priority, application Japan, Oct. 29, 1974, 49-124031; Oct. 2, 1975, 50-118242

Int. Cl.[2] C08C *19/22*; C08F *8/32*

U.S. Cl. 525—374 **3 Claims**

1. A method of vulcanizing bromobutyl rubber which comprises incorporating a vulcanizing amount of at least one amino acid selected from the group consisting of arginine, lysine, hydroxylysine, ornithine, cystine, asparagine, glutamine and

citrulline into bromobutyl rubber, and subjecting the resultant mixture, which does not contain any sulfur, sulfur-donor, zinc oxide, lead oxide or vulcanization accelerator, to vulcanization.



4,202,953

PROCESS FOR THE PRODUCTION OF POLYOLEFINS

Kazuo Matsuura, Kawasaki; Nobuyuki Kuroda, Yokohama; Takeichi Shiraishi, Kawasaki, and Mitsuji Miyoshi, Naka, all of Japan, assignors to Nippon Oil Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 594,244, Jul. 9, 1975, abandoned, which is a continuation of Ser. No. 427,725, Dec. 26, 1973, abandoned. This application Jan. 25, 1979, Ser. No. 6,431

Claims priority, application Japan, Dec. 28, 1972, 48/3578; Mar. 20, 1973, 48/31363

The portion of the term of this patent subsequent to Nov. 9, 1993, has been disclaimed.

Int. Cl.[2] **C08F** *4/02, 10/02*

U.S. Cl. 526—125 **5 Claims**

1. A process for the production of polyolefins which comprises polymerizing or copolymerizing olefins at a temperature of 20°–300° C. and a pressure of atmospheric to 70 kg/cm^2 in the presence of a catalyst resulting from:

(a) reacting a magnesium dihalide anhydride with an aluminum compound of the general formula:

$$Al(OR)_nX_{3-n}$$

where R is an alkyl, aryl and/or aralkyl group, X is a halogen atom, and n is an integer between 1 and 3, at temperatures ranging between 20° and 400° C., in a molar ratio of magnesium dihalide to aluminum compound ranging between 1:0.001 to 1:20, thereby forming a carrier;

(b) contacting a transistion metal compound with said carrier to be supported thereon at a temperature of 50° to 300° C., wherein said transition metal compound is selected from the group consisting of titanium compounds and vanadium compounds which are liquid under the treatment conditions, and are used in amounts of 0.1 to 50 times the amount of the carrier, and

(c) activating the same with use of an organo-metal compound of a metal of the Groups I to IV of the Periodic Table.

4,202,954

CONTINUOUS SOLUTION POLYMERIZATION PROCESS

Jean-Marie Massoubre, Clermont-Ferrand, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France

Division of Ser. No. 723,514, Sep. 15, 1976, which is a division of Ser. No. 639,373, Dec. 10, 1975. This application Sep. 29, 1978, Ser. No. 947,004

Claims priority, application France, Dec. 23, 1975, 74 42810

Int. Cl.[2] **C08F** *4/48*

U.S. Cl. 526—181 **4 Claims**

1. A process for the continuous solution homopolymerization or copolymerization in a hydrocarbon solvent, initiated by an organolithium initiator, of at least one conjugaged diene or of at least one conjugated diene with at least one vinyl aromatic compound in at least one reactor in which the monomers in solution in a hydrocarbon solvent are introduced continuously and from which the solution of homopolymers or copolymers formed and of unreacted monomers is also removed continuously, characterized by the fact that the polymerization reaction is carried out in a reactor of the open type at a temperature of 20° C. to 110° C. and in the presence of a deactivating system which inhibits the formation of gels and which comprises a termination agent which deactivates living macromolecules, said termination agent being a heavy alcohol of the formula $C_nH_{2n+1}OH$ with $n \geq 4$ or the corresponding carboxylic acid; the components of the deactivating system and the initiator being present in amounts such that the ratio of the deactivation velocities of the living macromolecules to the propagation velocity of the polymerization reaction is between 1×10^{-5} and 5×10^{-3}.

4,202,955

COPOLYMERS OF CYCLIC CONJUGATED DIENES AND MALEIC ANHYDRIDE

Norman G. Gaylord, New Providence, N.J., assignor to Borg-Warner Corporation, Chicago, Ill.

Continuation of Ser. No. 641,215, Dec. 16, 1975, abandoned, which is a continuation-in-part of Ser. No. 470,705, May 16, 1974, abandoned. This application Dec. 8, 1977, Ser. No. 858,757

Int. Cl.[2] **C08F** *220/08*

U.S. Cl. 526—272 **1 Claim**

1. A process for the preparation of saturated 2:1 copolymers of maleic anhydride and a cyclic conjugated diene said diene selected from the group consisting of cyclopentadiene and methylcyclopentadiene, which comprises heating maleic anhydride and said diene in the presence of a free radical precursor selected from the group consisting of peroxides, peresters and hydroperoxides, at a reaction temperature at which the free radical precursor has a half life of no more than two hours.

4,202,956

THIXOTROPIC ISOCYANATE-TERMINATED PREPOLYMERS AND USE IN THE PREPARATION OF POLYURETHANE COATING COMPOSITIONS

James D. Taylor, Flat Rock, Mich., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Nov. 13, 1978, Ser. No. 959,675

Int. Cl.[2] **C08G** *18/63, 18/14;* **B32B** *5/20*

U.S. Cl. 528—75 **8 Claims**

1. Liquid thixotropic isocyanate-terminated prepolymers prepared by the reaction of (a) a polyarylene polyalkylene polyisocyanate or diphenylmethane diisocyanate with (b) a graft polyol prepared by the in situ polymerization in the presence of a free radical catalyst of from 10 percent to 30 percent by weight of a mixture of from 55 percent to 75 percent by weight of styrene and from 45 percent to 25 percent by weight of acrylonitrile in from 90 percent to 70 percent by weight of a polyol containing from 0.05 mole to 3.0 moles of unsaturation per mole of polyol.

4,202,957

THERMOPLASTIC POLYURETHANE ELASTOMERS FROM POLYOXYPROPYLENE POLYOXYETHYLENE BLOCK COPOLYMERS

Henry W. Bonk, Wallingford, Conn., and Tilak M. Shah, S-Hertogenbosch, Netherlands, assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 504,183, Sep. 9, 1974, abandoned. This application Apr. 29, 1975, Ser. No. 572,741

Int. Cl.[2] **C08G** *18/48*

U.S. Cl. 528—77 **14 Claims**

1. A thermoplastic, recyclable polyurethane elastomer which is the product of reaction of

(a) 4,4'-methylenebis(phenyl isocyanate),

(b) a polyoxypropylene polyoxyethylene block copolymer having a molecular weight in the range of about 1000 to 3000, a pH within the range of 4.5 to 9, a primary hy-

droxyl content of not less than 50 percent and a content of alkali metal ion not greater than 25 ppm, said block copolymer having a minimum content of ethylene oxide (E.O.) residues for any given molecular weight (MW) corresponding to:

$$\% \text{ E.O.} = \left[\left(\frac{\text{MW} - 900}{4}\right) \times 3\right] \times \left[\frac{100}{\text{MW}}\right]$$

(c) an extender consisting of from 75 to 100 percent, on an equivalent basis, of a member selected from the class consisting of aliphatic straight chain diols having from 2 to 6 carbon atoms, inclusive, and the bis(2-hydroxyethyl)ethers of hydroquinone and resorcinol, and mixtures thereof and from 25 to 0 percent by equivalents of a member selected from the class consisting of (i) branched chain aliphatic diols from 3 to 6 carbon atoms, (ii) diethylene glycol and dipropylene glycol, (iii) polyethylene glycols having a molecular weight from 200 to 1500, (iv) polycaprolactone diols having a molecular weight from 500 to 3000, (v) polypropyelene glycols having a molecular weight from 400 to 1000, (vi) polytetramethylene glycols having a molecular weight from 650 to 1500 and (vii) mixtures of two or more of said diols or glycols;

the molar proportions of said block copolymer (b) to said extender (c) being within the range of about 1:1 to 1:12, and the ratio of equivalents of isocyanate to total equivalents of hydroxyl groups being within the range of about 1:0.96 to about 1:1.10.

4,202,958

PROCESS FOR THE PREPARATION OF POLYOLEFINS USING A REDUCED VANADIUM HALIDE CATALYST

Kazuo Yamaguchi, Fujisawa; Toru Tanaka, Komae; Shigeaki Okano, Yamato; Nobuo Enokido, Tokyo, and Masatoshi Suzuki, Fujisawa, all of Japan, assignors to Mitsubishi Chemical Industries, Ltd., Tokyo, Japan

Filed Dec. 28, 1977, Ser. No. 865,196

Claims priority, application Japan, Jan. 24, 1977, 52/6511

Int. Cl.[2] C08F *4/68*

U.S. Cl. 526—142 **6 Claims**

1. A process for the preparation of an ethylene homopolymer or copolymer which comprises polymerizing, at room temperature to 200° C., more than 90 wt% of ethylene and less than 10 wt% of other α-olefin by using a catalyst comprising (1) a solid catalyst component separated from a reduced reaction mixture obtained by reducing an organic solvent solution of a halogen-containing compound of vanadium with an organic aluminum compound in the presence of an ether represented by the general formula $R^1—O—R^2$, wherein R^1 and R^2 are hydrocarbon groups of 1 to 12 carbon atoms, R^1 and R^2 being independent or bound together to form a ring, at −60° to 90° C., wherein said ether is used in an amount of 0.1 to 100 moles per mole of said halogen-containing compound of vanadium and (2) an organic aluminum compound.

4,202,959

SULFITE-MODIFIED FIBROUS RESINOUS MATERIAL

Richard G. C. Henbest, and Kenneth McGregor, both of Stockton-on-Tees, England, assignors to Imperial Chemical Industries Limited, England

Filed Dec. 5, 1977, Ser. No. 857,972

Claims priority, application United Kingdom, Dec. 8, 1976, 51199/76

Int. Cl.[2] B32B *27/02, 27/42;* C08G *12/12, 12/32*

U.S. Cl. 528—254 **1 Claim**

1. An amino-formaldehyde resin selected from the group consisting of urea-formaldehyde, melamine formaldehyde and mixtures thereof, the said resin being in fiber form and containing 0.2 to 15 moles of sulphite radicals per 100 moles of $—CH_2—$ derived from formaldehyde.

4,202,960

THERMOSETTING AROMATIC RESINS AND THERMOSTABLE POLYMERS DERIVED THEREFROM

Guy Rabilloud, Grenoble; Bernard Masson, Poisat; Pierre Giuliani, and Bernard Sillion, both of Grenoble, all of France, assignors to Institut Francais du Petrole, Rueil Malmaison, France

Filed Sep. 16, 1977, Ser. No. 834,026

Claims priority, application France, Sep. 17, 1976, 76 28408

Int. Cl.[2] C08G *61/02*

U.S. Cl. 528—271 **34 Claims**

1. A process for the preparation of a thermostable, infusible, insoluble polymer, comprising the steps of:

(i) reacting meta-terphenyl with acetyl chloride and aluminum chloride under such conditions as to form oligomers;

(ii) separating an organic phase oligomer-containing composition comprising components having a molecular weight of about from 300 to 5000, said composition having a softening temperature from about 80° to 400° C. and a predominant fraction of the contained oligomers having a substantially higher percentage of combined percentages of carbon plus hydrogen than the combined percentages of carbon plus hydrogen in diacetyl meta-terphenyl; and

(iii) heating the resulting composition to a sufficient temperature and for a sufficient time in the presence of an acid catalyst to yield said thermostable, infusible, insoluble polymer.

4,202,961

TRANSPARENT POLYAMIDE FROM AROMATIC DICARBOXYLIC ACID AND DISUBSTITUTED DECANE DIAMINE

Josef Pfeifer, Therwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 26, 1978, Ser. No. 954,808

Claims priority, application Switzerland, Oct. 28, 1977, 13148/77

Int. Cl.[2] C08G *69/26*

U.S. Cl. 528—324 **11 Claims**

1. A transparent moldable polyamide which is obtained by polycondensing a mixture of essentially stoichiometric amounts of terephthalic acid, or of an amide-forming derivative thereof, and a diamine of the formula I

$$H_2N—\underset{\displaystyle R_1}{\underset{|}{CH}}—(CH_2)_8—\underset{\displaystyle R_2}{\underset{|}{CH}}—NH_2 \qquad \text{(I)}$$

(a) with 10 to $(n \times 2.5) + 7.5$ percent by weight of an ω-aminocarboxylic acid of the formula II

$$H_2N—R_3—COOH \qquad \text{(II)}$$

or of the corresponding lactam, or

(b) with 10 to $(m + p/2 \times 2.5) + 7.5$ percent by weight of a mixture of essentially stoichiometric amounts of a dicarboxylic acid of the formula III

$$HOOC—R_4—COOH \qquad \text{(III)}$$

and a diamine of the formula IV

$$H_2N—R_5—NH_2 \qquad \text{(IV)},$$

or of the equivalent amount of a mixture of essentially stoichiometric amounts of an amide-forming derivative of a dicarboxylic acid of the formula III and a diamine of the formula IV, wherein the weight percentages as defined relate to the sum of all the reaction components, and wherein

R_1 and R_2 independently of one another are cycloalkyl which has 4–12 C atoms and which can be substituted by alkyl,

R_3 is alkylene having 5–11 C atoms,
R_4 is alkylene having 4–10 C atoms, and
R_5 is alkylene having 6–12 C atoms, and wherein
n is equal to the number of C atoms in the radical R_3,
m is equal to the number of C atoms in the radical R_4, and
p is equal to the number of C atoms in the radical R_5.

4,202,962

FIBERS OF ARYLENE OXADIAZOLE/ARYLENE N-ALKYLHYDRAZIDE COPOLYMER

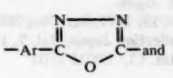
Hartwig C. Bach, Pensacola, Fla., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 739,165, Nov. 5, 1976, and a continuation-in-part of Ser. No. 886,317, Mar. 13, 1978, abandoned, which is a division of Ser. No. 520,503, Nov. 4, 1974, Pat. No. 4,115,503, which is a continuation-in-part of Ser. No. 390,667, Aug. 22, 1973, abandoned, and a continuation-in-part of Ser. No. 442,041, Dec. 5, 1973, abandoned, and a continuation-in-part of Ser. No. 202,590, Nov. 26, 1971, abandoned, and a continuation-in-part of Ser. No. 202,669, Nov. 26, 1971, abandoned. This application Jan. 15, 1979, Ser. No. 3,174

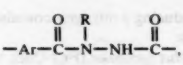
Int. Cl.[2] C08G *73/08*

U.S. Cl. 528—363 **7 Claims**

1. A fiber of a copolymer consisting essentially of recurring units of the formulas



(I)



(II)

wherein Ar is arylene and R is lower alkyl and wherein the mole ratio of units (I) to units (II) is between 20:80 and 95:5, said fiber being characterized in having a tenacity ranging from 8.5 to 30 grams per denier and a modulus ranging from 150 to 625 grams per denier.

4,202,963

VULCANIZATION SYSTEM FOR THIODIETHANOL-BASED ELASTOMERS

Rudolf A. Behrens, Gladstone, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Mar. 5, 1979, Ser. No. 17,655

Int. Cl.[2] C08G *75/04*

U.S. Cl. 528—374 **11 Claims**

1. A vulcanizable elastomer composition comprising a mixture of (1) a vulcanizable elastomer of thiodiethanol, (2) sulfur, and (3) an aliphatic linear, branched chain, or cyclic polyamine selected from the group consisting of (A) polyethyleneamines represented by the formula (I):

$$H—HN\ CH_2CH_2]_nNH_2 \quad (I)$$

wherein n is an integer from 1 to about 10; (B) complex reaction mixtures of polyethyleneamines, boiling above the boiling point of diethylenetriamine, (C) salts of polyethyleneamines with organic acids having a dissociation constant less than about 10^{-3}; and (D) mixtures thereof; said vulcanizable elastomer of thiodiethanol being a copolymer represented by the formula (II):

$$H—OG]_mOH \quad (II)$$

wherein —OG— comprises randomly alternating structural units selected from:

(E) structural units (III) and (IV)

$$—OC_2H_4SC_2H_4— \quad (III)$$

$$—OR— \quad (IV)$$

or (F) structural units (III), (IV), and (V)

$$—OR'— \quad (V)$$

wherein R is one or more radicals remaining on removal of two hydroxyl groups from:

(a) saturated aliphatic linear, branched chain or cyclic diols, or

(b) aliphatic linear, branched chain or cyclic diols containing external unsaturation having an allylic hydrogen atom;

wherein R' is one or more radicals which remain on removal of two hydroxyl groups from a diphenolic compound; said copolymers comprising structural units (E) and (F) being characterized in that:

(1) m is an integer sufficient to provide in said copolymer an average molecular weight of at least 8000;

(2) the molar ratio of (III) to (IV), when said copolymer comprises structural units (E), or the molar ratio of (III) to the total of (IV) and (V) when said copolymer comprises structural units (F), being not less than 1:1; and

(3) containing from about 1 to 10 mole percent of said diol (b), based on the total of all units (III), (IV), and (V) present in said copolymer.

4,202,964

METHOD FOR REDUCING OLIGOMERIC CYCLIC ETHER CONTENT OF A POLYMERIZATE

Gerfried Pruckmayr, Media, Pa., and Ivan M. Robinson, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 887,332, Mar. 16, 1978, abandoned. This application Nov. 27, 1978, Ser. No. 962,311

Int. Cl.[2] C08G *65/30*

U.S. Cl. 528—482 **8 Claims**

1. A method for reducing the oligomeric cyclic ether content of a tetrahydrofuran/alkylene oxide polymerizate, the method comprising bringing the polymerizate into contact, at a temperature of 60°–150° C., with 0.5–25% , by weight of the polymerizate, of a cationic ion exchange resin bearing —SO_3H groups, insoluble in the reaction medium, for a time sufficient to significantly reduce the oligomeric cyclic ether content of the polymerizate.

4,202,965

METHOD FOR ISOLATING SOLID POLYARYLENE ESTER FROM ITS ORGANIC SOLVENT SOLUTION

Senzo Shimizu, Odawara; Isao Nomura, and Masahiro Harada, both of Hiratsuka, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Sep. 22, 1978, Ser. No. 945,068

Claims priority, application Japan, Sep. 26, 1977, 52-115376

Int. Cl.[2] C08G *63/72, 63/74*

U.S. Cl. 528—499 **10 Claims**

1. A method for isolating a polyarylene ester from a solution of the polyarylene ester in tetrahydrofuran and/or dioxane which solution is prepared by polycondensing a dihydric phenol compound and an aromatic dicarboxylic acid or its derivative, which comprises adding water to the solvent solution to form a water-containing solution, the weight ratio of water to the solvent solution being from 0.03 to 0.3, subjecting the resulting water-containing solution to an aging treatment, then precipitating substantially all of the polyarylene ester as a particulate solid from the water-containing solution, and separating the precipitated polyarylene ester from the water-containing solution.

4,202,966
GLUCAN POLYSACCHARIDE

Akira Misaki, 5-21, Kanno-cho, Nishinomiya-shi, Hyogo, Japan; Shigeo Takaya, Shizuoka, Japan; Koji Yokobayashi, Okayama, Japan, and Yoichi Tsuburaya, Sakai, Japan, assignors to Director-Gen. of the Tea Experiment Station, Ministry of Agriculture and Forestry Japanese Government, Shizuoka; Akira Misaki, Hyogo and Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo, Okayama, all of, Japan

Filed Dec. 23, 1977, Ser. No. 864,015
Claims priority, application Japan, Dec. 31, 1976, 51-157935
Int. Cl.[2] C08B *37/00*
U.S. Cl. 536—1 **1 Claim**

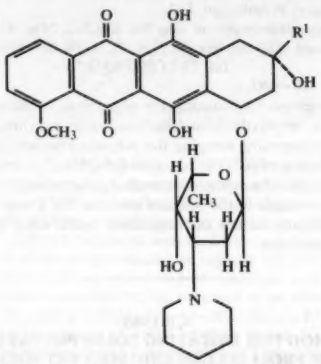
1. A glucan (elsinan) comsisting predominantly of repeating units of [3)-Glc-(1→4)-Glc-(1→4)-Glc-(1→] (wherein Glc represents alpha-D-glucopyranose residue), said glucan having a molecular weight of approximately 5,000 to approximately 10,000,000.

4,202,967
N,N-PENTAMETHYLENE DERIVATIVES OF DAUNOMYCIN AND ADRIAMYCIN

George L. Tong, Cupertino, Calif.; David W. Henry, Chapel Hill, N.C.; Helen Y. Wu, San Jose, and Thomas H. Smith, San Carlos, both of Calif., assignors to SRI International, Menlo Park, Calif.

Filed Oct. 2, 1978, Ser. No. 947,463
Int. Cl.[2] C07H *15/24*
U.S. Cl. 536—17 A **5 Claims**

1. Compounds of the formula



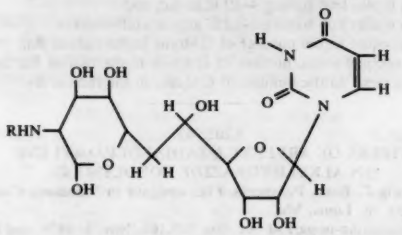
wherein R^1 is selected from the group consisting of $—COCH_3$, $—CHOHCH_3$, $—COCH_2OH$ and $—CHOHCH_2OH$ and the pharmaceutically acceptable acid addition salts of said compounds.

4,202,968
NEW TUNICAMINE DERIVATIVES AND THEIR PREPARATION

Gakuzo Tamura, Tokyo, and Akira Takatsuki, Ichikawa, both of Japan, assignors to Meiji Seika Kaisha, Ltd., Tokyo, Japan

Filed Jun. 29, 1978, Ser. No. 920,448
Claims priority, application Japan, Jul. 6, 1977, 52-79819
Int. Cl.[2] C07H *17/00*
U.S. Cl. 536—23 **3 Claims**

1. A tunicamine derivative of the formula:



(I)

wherein R represents hydrogen or a fatty acid residue of the formula $(CH_3)_2CH(CH_2)_nCH{=}CHCO—$ where n represents an integer of 8 to 11 inclusive.

4,202,969
METHOD OF PRODUCING NITROGEN-CONTAINING POLYSACCHARIDES

Saburo Ueno, Ichigayadai; Chikao Yoshikumi, Kunitachi; Fumio Hirose, Tokyo; Yoshio Omura, Tanashi; Toshihiko Wada, Mibu; Takayoshi Fujii, Tokyo, and Eiichi Takahashi, Kawaguchi, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 19, 1977, Ser. No. 788,992
Claims priority, application Japan, Jul. 7, 1976, 51-80664
Int. Cl.[2] C07H *1/08*
U.S. Cl. 536—1 **3 Claims**

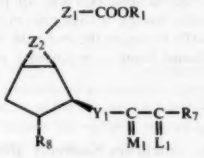
1. A method of producing a nitrogen-containing polysaccharide which comprises:
   (a) extracting *Coriolus versicolor* (Fr.) Quél. with an aqueous alkaline solution having a concentration within the range of from 0.01 to 2.0 N at a temperature of from 50° to 100° C.;
   (b) neutralizing the resultant extract and including an alkaline salt therewith at a concentration of at least 0.4 M/l, whereby the molecular shape of said polysaccharide is rendered more spherical; and
   (c) subjecting the thus-spherically modified polysaccharide to ultrafiltration through a membrane as a molecular seive under a pressure of at least 0.5 kg/cm^2, whereby portions of the mixture having a molecular weight of less than 5000 are removed therefrom.

4,202,970
11-DEOXY-TRANS-4,5-DIDEHYDRO-PGI$_1$ COMPOUNDS

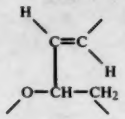
Donald E. Ayer, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 821,542, Aug. 3, 1977. This application Aug. 31, 1978, Ser. No. 938,549
Int. Cl.[2] C07D *307/93*
U.S. Cl. 542—426 **63 Claims**

1. A prostacyclin analog of the formula

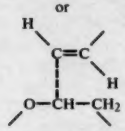


wherein Y_1 is trans—CH=CH—, cis—CH=CH—, or $—CH_2CH_2—$;
wherein Z_2 is



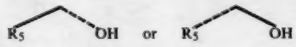
(1)

or



(2)

wherein Z_1 is
(1) $-(CH_2)_g-CH_2-CH_2-$, or
(2) $-(CH_2)_g-CH_2-CF_2-$,
wherein g is the integer zero, one, or 2;
wherein R_8 is hydrogen or hydroxymethyl;
wherein M_1 is

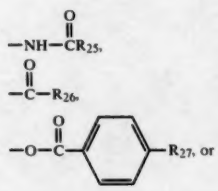


wherein R_5 is hydrogen or alkyl with one to 4 carbon atoms, inclusive,
wherein L_1 is

or a mixture of

and

wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;
wherein R_1 is hydrogen; alkyl of one to 12 carbon atoms, inclusive; cycloalkyl of 3 to 10 carbon atoms, inclusive; aralkyl of 7 to 12 carbon atoms, inclusive; phenyl; phenyl substituted with one, two or three chloro or alkyl of one to 3 carbon atoms; phenyl substituted in the para position by



(a)
(b)
(c)

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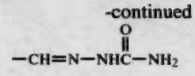
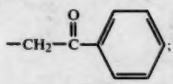
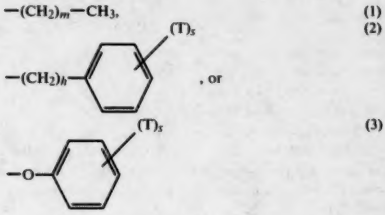


(d)

wherein R_{25} is methyl, phenyl, acetamidophenyl, benzamidophenyl, or $-NH_2$; R_{26} is methyl, phenyl, $-NH_2$, or methoxy; and R_{27} is hydrogen or acetamido, inclusive; phenacyl, i.e.,



phenacyl substituted in the para position by chloro, bromo, phenyl, or benzamido; or a pharmacologically acceptable cation;
wherein R_7 is



(1)
(2)
, or
(3)

wherein m is the integer one to 5, inclusive, h is the integer zero to 3, inclusive; s is the integer zero, one, 2, or 3, and T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, with the proviso that not more than two T's are other than alkyl.

4,202,971

ENLARGED-HETERO-RING PROSTACYCLIN ANALOGS

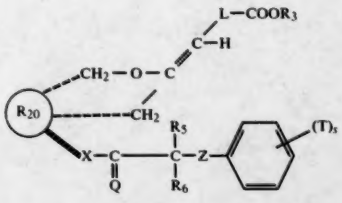
Robert C. Kelly, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 935,291, Aug. 21, 1978, which is a division of Ser. No. 819,941, Jul. 28, 1977, Pat. No. 4,124,599, which is a continuation-in-part of Ser. No. 725,547, Sep. 22, 1976, abandoned, which is a continuation-in-part of Ser. No. 716,771, Aug. 23, 1976, abandoned. This application Feb. 15, 1979, Ser. No. 12,263

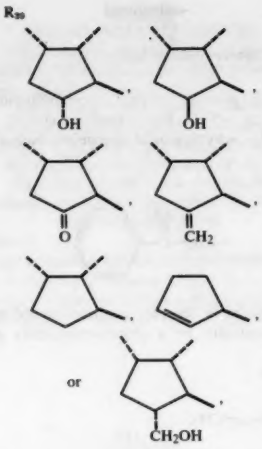
Int. Cl.[2] **C07D** *311/94*

U.S. Cl. 542—426 **17 Claims**

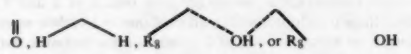
1. A 5Z compound of the formula



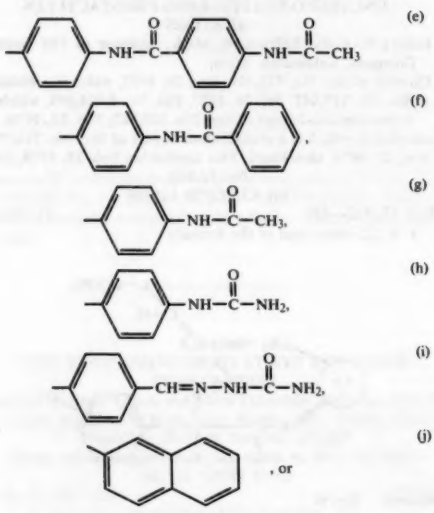
wherein R_{20} is



wherein L is
(1) $-(CH_2)_d-C(R_2)_2-$
(2) $-CH_2-O-CH_2-Y-$ or
(3) $-CH_2CH=CH-$
wherein d is zero to 5, R_2 is hydrogen, methyl, or fluoro, being the same or different with the proviso that one R_2 is not methyl when the other is fluoro, and Y is a valence bond, $-CH_2-$ or $-(CH_2)_2-$,
wherein Q is



wherein R_8 is hydrogen or alkyl of one to 4 carbon atoms, inclusive,
wherein R_3 is (a) cycloalkyl of 3 to 10 carbon atoms, inclusive, (b) aralkyl of 7 to 12 carbon atoms, inclusive, (c) phenyl, (d) phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive,



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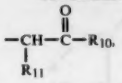


(k)

wherein R_{10} is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl, and wherein R_{11} is hydrogen or benzoyl; wherein R_5 and R_6 are hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro, being the same or different, with the proviso that one of R_5 and R_6 is fluoro only when the other is hydrogen or fluoro and the further proviso that neither R_5 nor R_6 is fluoro when Z is oxa (—O—); wherein Z represents an oxa atom (—O—) or C_jH_{2j} wherein C_jC_{2j} is a valence bond or alkylene of one to 9 carbon atoms, inclusive, with one to 6 carbon atoms, inclusive between CR_5R_6— and the phenyl ring;
wherein T is alkyl of one to 4 carbon atoms, inclusive, fluoro, chloro, trifluoromethyl, or $-OR_7$— wherein R_7 is alkyl of one to 4 carbon atoms, inclusive, and s is zero, one, 2 or 3, with the proviso that not more than two T's are other than alkyl and when s is 2 or 3 the T's are either the same or different; and
wherein X is
(1) trans—CH=CH—
(2) cis—CH=CH—
(3) —C≡C— or
(4) $-CH_2CH_2-$;
including the lower alkanoates thereof.

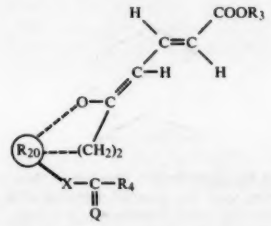
4,202,972

Δ^2-PROSTACYCLIN ANALOGS

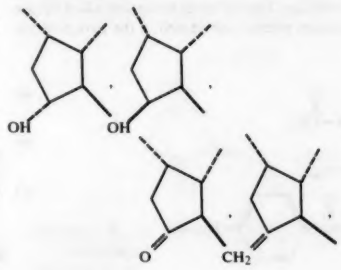
Roy A. Johnson, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 819,856, Jul. 28, 1977, Pat. No. 4,123,441, which is a continuation-in-part of Ser. No. 725,546, Sep. 22, 1976, abandoned, which is a continuation-in-part of Ser. No. 716,960, Aug. 23, 1976, abandoned. This application Aug. 23, 1978, Ser. No. 936,295
Int. Cl.[2] **C07D** *311/02*
U.S. Cl. 542—426 **32 Claims**

1. A 4Z compound of the formula



wherein is



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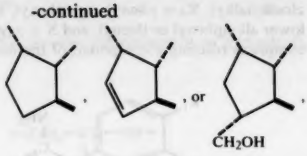
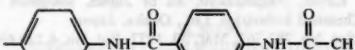
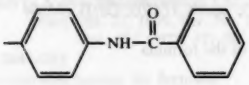
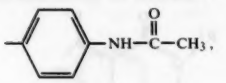


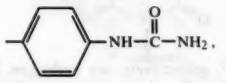
wherein
Q is

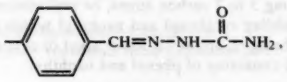
wherein
R_8 is hydrogen or alkyl of one to 4 carbon atoms, inclusive,
wherein
R_3 is (a) hydrogen, (b) alkyl of one to 12 carbon atoms, inclusive, (c) cycloalkyl of 3 to 10 carbon atoms, inclusive, (d) aralkyl of 7 to 12 carbon atoms, inclusive, (e) phenyl, (f) phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive,

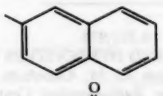

(g)

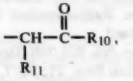

(h)


(i)

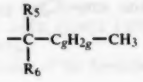

(j)


(k)


(l)


(m)

wherein
R_{10} is phenyl, p-bromophenyl, p-biphenylyl, p-nitrophenyl, p-benzamidophenyl, or 2-naphthyl, and wherein R_{11} is hydrogen or benzoyl, or (n) a pharmacologically acceptable cation;
wherein
R_4 is


(1)

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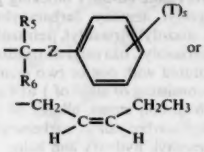

(2)

(3)

wherein
C_gH_{2g} is alkylene of one to 9 carbon atoms, inclusive, with one to 5 carbon atoms, inclusive, in the chain between —CR_5R_6— and terminal methyl, wherein R_5 and R_6 are hydrogen, alkyl of one to 4 carbon atoms, inclusive, or fluoro, being the same or different, with the proviso that one of R_5 and R_6 is fluoro only when the other is hydrogen or fluoro and the further proviso that neither R_5 nor R_6 is fluoro when Z is oxa (—O—);
wherein
Z represents an oxa atom (—O—) or C_jH_{2j} wherein C_jH_{2j} is a valence bond or alkylene of one to 9 carbon atoms, inclusive, with one to 6 carbon atoms, inclusive between CR_5R_6— and the phenyl ring;
wherein
T is alkyl of one to 4 carbon atoms, inclusive, fluoro, chloro, trifluoromethyl, or —OR_7— wherein R_7 is alkyl of one to 4 carbon atoms, inclusive, and s is zero, one, 2 or 3, with the proviso that not more than two T's are other than alkyl and when s is 2 or 3 the T's are either the same or different; and
wherein
X is
(1) trans—CH=CH—
(2) cis—CH=CH—
(3) —C≡C— or
(4) —CH_2CH_2—;
including the lower alkanoates thereof.

4,202,973

KETENIMINE CEPHALOSPORINS

Andrew W. Taylor, Dorking; George Burton, Sutton, and John P. Clayton, Horsham, all of England, assignors to Beecham Group Limited, England

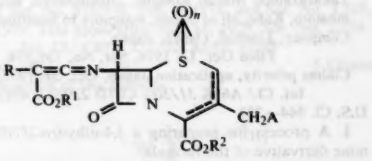
Filed Jun. 27, 1977, Ser. No. 810,330

Claims priority, application United Kingdom, Jun. 26, 1976, 26684/76

Int. Cl.[2] C07D *501/18*

U.S. Cl. 544—21 **14 Claims**

1. A ketenimine of the formula:



wherein
R is furyl, thienyl, cycloalkyl, cycloalkenyl, phenyl or phenyl substituted with from 1 to 3 members selected from the group consisting of hydroxy, halogen, nitro, alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms, amino and carboxy;
R^1 is alkyl of 1 to 6 carbon atoms, benzyl, phthalidyl, indanyl, phenyl, or phenyl substituted with from 1 to 3 alkyl groups of 1 to 6 carbon atoms;
R^2 is hydrogen, an in vivo hydrolysable ester group selected from the group consisting of acyloxyalkyl, alkoxycar-

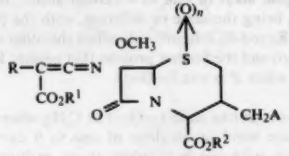
bonyloxyalkyl, lactone, thiolactone and dithiolactone or a chemically hydrolysable carboxy blocking group;

A is hydrogen, pyridyl, acetoxy, carbamoyloxy, or S-Het wherein Het is diazolyl, triazolyl, tetrazolyl, thiazolyl, thiadiazolyl, thiatriazolyl, oxazolyl or oxadiazolyl, unsubstituted or substituted with one or two members selected from the group consisting of alkyl of 1 to 6 carbon atoms, alkenyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms, alkoxyalkyl, carboxyalkyl, carbamoyl, carbamoylmethyl trifluoromethyl, hydroxy and halo;

n is zero or 1; and

the dotted line represents a double bond at either the 2- or 3-position.

7. A 7α-methoxy ketenimine of the formula:



wherein

R is furyl, thienyl, cycloalkyl, cycloalkenyl, phenyl or phenyl substituted with from 1 to 3 members selected from the group consisting of hydroxy, halogen, nitro, alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms, amino and carboxy;

R^1 is benzyl, phthalidyl, indanyl, phenyl, or phenyl substituted with from 1 to 3 alkyl groups of 1 to 6 carbon atoms;

R^2 is hydrogen, an in vivo hydrolysable ester group selected from the group consisting of acyloxyalkyl, alkoxycarbonyloxyalkyl, lactone, thiolactone and dithiolactone or a chemically hydrolysable carboxy blocking group;

A is hydrogen, pyridyl, acetoxy, carbamoyloxy, or S-Het wherein Het is diazolyl, triazolyl, tetrazolyl, thiazolyl, thiadiazolyl, thiatriazolyl, oxazolyl or oxadiazolyl, unsubstituted or substituted with one or two members selected from the group consisting of alkyl of 1 to 6 carbon atoms, alkenyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms, alkoxyalkyl, carboxyalkyl, carbamoyl, carbamoylmethyl, trifluoromethyl, hydroxy and halo;

n is zero or 1; and

the dotted line represents a double bond at either the 2- or 3-position.

4,202,974

PROCESS FOR PREPARING 3,4-DIHYDRO-2(1H)-QUINAZOLINONE DERIVATIVES

Michihiro Yamamoto, Nishinomiya; Shigenari Katayama, Takarazauka; Masao Koshiba, Nishinomiya, and Hisao Yamamoto, Kobe, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

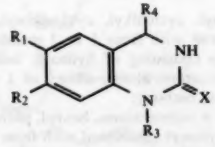
Filed Oct. 12, 1976, Ser. No. 731,574

Claims priority, application Japan, Oct. 24, 1975, 50-128578

Int. Cl.[2] A61K *31/505;* **C07D** *239/82, 491/04*

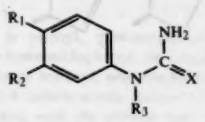
U.S. Cl. 544—251 **2 Claims**

1. A process for preparing a 3,4-dihydro-2(1H)-quinazolinone derivative of the formula,



(I)

wherein R_1 and R_2 are each hydrogen, lower alkyl, lower alkylthio or lower alkoxy, or, when taken together, R_1 and R_2 may form methylenedioxy; R_3 is lower alkyl or lower cycloalkylalkyl; R_4 is phenyl, halophenyl, lower alkoxyphenyl, lower alkylphenyl or thienyl; and X is oxygen or sulfur, which comprises reacting a compound of the formula,



(II)

wherein R_1, R_2, R_3 and X are as defined above, with a compound of the formula,

R_4—CHO (III)

wherein R_4 is as defined above, with heating under reflux in an inert solvent selected from the group consisting of benzene, toluene, xylene, chlorobenzene, dichloroethane and tetrachloroethane in the presence of hydrobromic acid, which is used in an amount of 1.0 to 0.01 molar equivalent based on the compound of formula (II).

4,202,975

ISOXAZOLO[3,4-D]PYRIMIDINES

Ryuji Marumoto, Minoo; Yoshiyasu Furukawa, Toyonaka, and Kiyohisa Kawai, Nagaokakyo, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

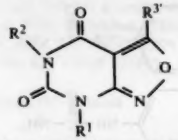
Division of Ser. No. 782,762, Mar. 30, 1977, Pat. No. 4,129,654. This application Sep. 27, 1978, Ser. No. 946,189

Claims priority, application Japan, Apr. 5, 1976, 51-38419

Int. Cl.[2] A61K *31/505;* **C07D** *491/04*

U.S. Cl. 544—255 **7 Claims**

1. A compound of the formula



wherein R^1 and R^2, respectively, are hydrogen, lower alkyl, cycloalkyl having 5 to 7 carbon atoms, or aryl selected from the group consisting of phenyl and naphthyl which may be substituted by halogen, and $R^{3'}$ is lower alkyl or aryl selected from the group consisting of phenyl and naphthyl.

4,202,976

SELENIUM-75 LABELLED DERIVATIVES OF FOLATES

Russell J. Bayly; Virginia E. M. Chambers, and Reginald Monks, all of c/o The Radiochemical Centre, Amersham, Buckinghamshire, England

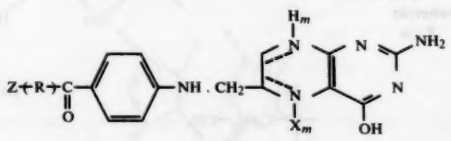
Continuation-in-part of Ser. No. 531,748, Dec. 11, 1974, Pat. No. 4,115,065. This application Nov. 21, 1977, Ser. No. 853,565

Claims priority, application United Kingdom, Sep. 11, 1973, 57433/73

Int. Cl.[2] C07D *475/04*

U.S. Cl. 544—261 **6 Claims**

1. A compound having the general formula (III)

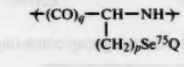


where a dotted bond line indicates that the bond may be single or double, and where

X is H or $-CH_3$,

m is 0 or 1 (such that the adjacent nitrogen atom is trivalent), and either

(a) R is



and is attached through the nitrogen atom to the pteroyl residue where

q is 0 or 1

p is 1 or 2

Q is C_xH_{2x+1} where x is from 1 to 6

and when q is 0, Z is H and when q is 1, Z is HO, or

(b) R is

$-CO.CHY.CHY.CH(COOH)NH-$

and is attached through the nitrogen atom to the pteroyl residue, where Z is HO,

one group Y is $-H$

and the other group Y is $-Se^{75}C_xH_{2x+1}$ where x is from 1 to 6 or an ester or salt of such acid.

4,202,977

S-TRIAZOLO [1,5-A] PYRIDINE DERIVATIVES

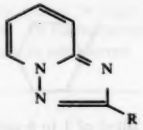
Tsutomu Irikura, Tokyo, and Seigo Suzue, Kuki, both of Japan, assignors to Kyorin Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Feb. 27, 1979, Ser. No. 15,590

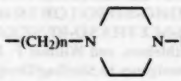
Int. Cl.[2] C07D *471/04*

U.S. Cl. 544—362 **11 Claims**

1. A compound having the formula,



wherein R represents $-CH{=}N-R^1$ (wherein R^1 represents dimethylamino) and



(wherein R^2 represents phenyl, 2-methoxyphenyl, benzyl, 2-chlorobenzyl and 2-pyridyl, and n represents 3 and 5), and the acid addition salts thereof.

4,202,978

(S)-1-[2-(4-(2-HYDROXY-S-(1-ALKYLAMINOPROPOXY)-PHENYLALKYL]-4-PHENYLPIPERAZINES

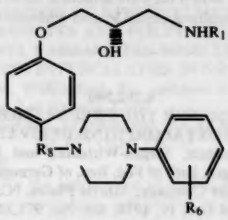
Kenneth E. Fahrenholtz, Bloomfield; Robert W. Guthrie, Saddle Brook; Richard W. Kierstead, and Jefferson W. Tilley, both of North Caldwell, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Feb. 8, 1978, Ser. No. 875,966

Int. Cl.[2] A61K *31/495*; C07D *295/08, 295/14*

U.S. Cl. 544—393 **26 Claims**

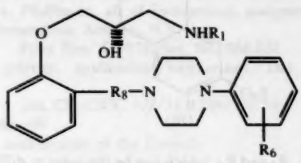
1. The compounds of the formulae



wherein R_1 is lower alkyl; R_8 is selected from the group consisting of $-O-(CH_2)_n$-wherein n is 2 to 20,

$$-NHC-(CH_2)_n- \text{ and } -CH_2CNH-(CH_2)_n-;$$

and R_6 is selected from the group consisting of hydrogen or lower alkoxy, and



wherein R_1 is lower alkyl; R_8 is selected from the group consisting of $-O-(CH_2)_n$-wherein n is 2 to 20,

$$-NHC-(CH_2)_n- \text{ and } -CH_2CNH-(CH_2)_n-;$$

and R_6 is selected from the group consisting of hydrogen or lower alkoxy, the racemates thereof and the pharmaceutically acceptable salts thereof.

4,202,979

6-ETHYL(OR ALLYL)-8-METHOXYMETHYL OR METHYLMERCAPTOMETHYLERGOLINES AND RELATED COMPOUNDS

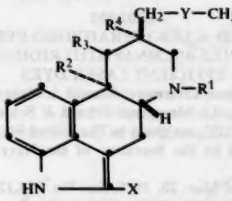
Edmund C. Kornfeld, and Nicholas J. Bach, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 875,978, Feb. 8, 1978, and Ser. No. 2,515, Jan. 11, 1979. This application Jan. 11, 1979, Ser. No. 2,514

Int. Cl.[2] C07D *457/02*; A61K *31/48*

U.S. Cl. 546—67 **5 Claims**

1. A compound of the formula



wherein Y is O, SO, SO_2 or S, R^1 is ethyl, or allyl, X is H, Cl or Br and R^2, R^3 and R^4 when taken singly are hydrogen, and

R^2 and R^3, and R^3 and R^4, when taken together with the carbon atoms to which they are attached, form a double bond, and pharmaceutically-acceptable acid addition salts thereof.

4,202,980

PROCESS FOR THE PREPARATION OF 1-HYDROXYAPORPHINE-DERIVATIVES

Johannes Hartenstein, Stegen-Wittental, and Gerhard Satzinger, Denzlingen, both of Fed. Rep. of Germany, assignors to Warner-Lambert Company, Morris Plains, N.J.

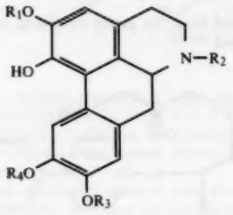
Filed Dec. 19, 1978, Ser. No. 971,142

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1977, 2757281

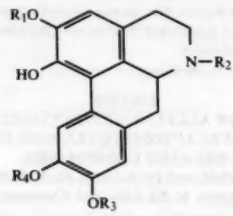
Int. Cl.[2] C07D *221/18*

U.S. Cl. 546—75 **9 Claims**

1. Process for the preparation of 1-hydroxy-aporphine derivatives of the general formula:



in which R_1, R_3 and R_4, which can be the same or different, are lower alkyl, aryl or aralkyl radicals or R_3 and R_4 can together form a lower alkylene bridge member and R_2 is a hydrogen atom or a lower alkyl, aralkyl or alkoxycarbonyl radical or an acyl radical derived from an aliphatic, aromatic or araliphatic carboxylic acid, wherein a tetrahydroisoquinoline compound of the general formula:



in which R_1, R_2, R_3 and R_4 have the same meanings as above, is oxidised in the presence of a strong acid with at least an equivalent amount of vanadyl chloride.

4,202,981

SUBSTITUTED -6,7,8,9-TETRAHYDRO-PYRIDO- AND 2H-PYRANO [2,3-B][1,8]NAPHTHYRIDINES, STABLE EFFICIENT LASER DYES

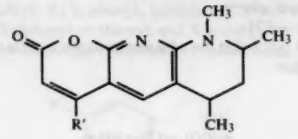
Peter R. Hammond, Livermore; Ronald A. Henry, China Lake; John A. Trias, La Mesa, and Erhard J. Schimitischek, San Diego, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 20, 1978, Ser. No. 888,125

Int. Cl.[2] C07D *471/14, 491/14*

U.S. Cl. 546—82 **5 Claims**

1. The compounds having the structure:



wherein R' is selected from the group consisting of H and CH_3.

4,202,982

PROCESS FOR THE PREPARATION OF 14-HYDROXYMORPHINAN DERIVATIVES

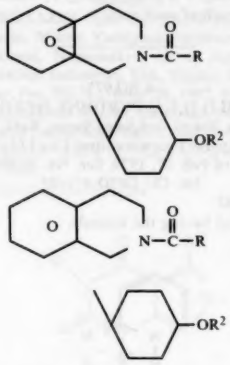
Ivo Monkovic, Candiac; Carol Bachand, Cote Ste-Catherine, and Henry Wong, Candiac, all of Canada, assignors to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 837,123, Sep. 28, 1977, Pat. No. 4,153,603, which is a division of Ser. No. 669,795, Mar. 23, 1976, Pat. No. 4,058,531. This application Mar. 22, 1979, Ser. No. 22,669

Int. Cl.[2] C07D *217/04, 491/04*

U.S. Cl. 546—89 **5 Claims**

3. The compounds having the formulas



in which R^2 is (lower)alkyl of 1 to 6 carbon atoms and R is cyclopropyl or cyclobutyl.

4,202,983

11-(LOWER-ALKOXY- AND LOWER-ALKYLTHIO-3-OXO-LOWER-ALKYL)-HEXAHYDRO-2,6-M ETHANO-BENZAZOCINES

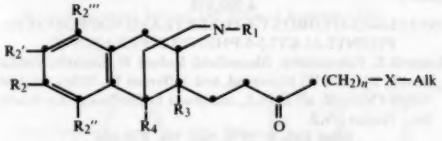
Thomas R. Lewis, Bethlehem, and William F. Michne, Poestenkill, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 886,782, Mar. 15, 1978, abandoned. This application Mar. 26, 1979, Ser. No. 23,613

Int. Cl.[2] C07D *221/26*

U.S. Cl. 546—97 **8 Claims**

1. A compound having the formula:



where R_1 is hydrogen, lower-alkyl, cyclololoweralkyl-lower-alkyl, phenyl-lower-alkyl, lower-alkenyl or lower-alkynyl; R_2,

R_2', R_2'' and R_2''' are each hydrogen, or three of them are hydrogen and the fourth is hydroxy, methoxymethoxy or lower-alkoxy; R_3 and R_4 are each hydrogen or lower-alkyl, or R_3 and R_4 together are divalent lower-alkylene, $-(CH_2)_m-$, where m is one of the integers 3 and 4; n is one of the integers from 2 to 4; X is oxygen or sulfur; and Alk is lower-alkyl; or an acid-addition salt thereof.

4,202,984

β-(HEXAHYDRO-2,6-METHANO-3-BENZAZOCIN-11-YL)PROPIONIC ACIDS, ESTERS AND AMIDES

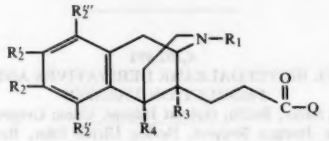
Thomas R. Lewis, Bethlehem, and William F. Michne, Poestenkill, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 886,650, Mar. 15, 1978, abandoned. This application May 4, 1979, Ser. No. 35,937

Int. Cl.[2] **C07D** *221/26*

U.S. Cl. 546—97 **21 Claims**

1. A compound having the formula



where R_1 is hydrogen, lower-alkyl, cycloloweralkyl-lower-alkyl, phenyl-lower-alkyl, lower-alkenyl or lower-alkynyl; R_2, R_2', R_2'' and R_2''' are each hydrogen, or three of them are hydrogen and the fourth is hydroxy, lower-alkoxy, methoxymethoxy or benzyloxy; R_3 and R_4 are each hydrogen or lower-alkyl, or R_3 and R_4 together are divalent lower-alkylene, $-(CH_2)_n-$, where n is one of the integers 3 or 4; and Q is hydroxy, lower-alkoxy, amino, N-lower-alkylamino, N,N-dilower-alkylamino or N-(carbo-lower-alkoxy-lower-alkyl-)amino; or an acid-addition salt thereof.

4,202,985

IMIDAZOLYLETHOXY DERIVATIVES OF QUINOLINE-3-METHANOLS

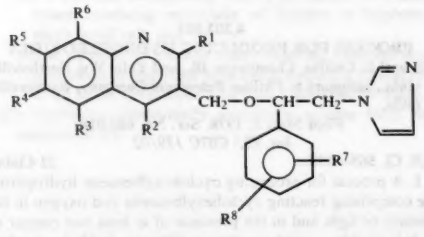
Hans Hoehn, Tegernheim, Fed. Rep. of Germany, assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Oct. 25, 1978, Ser. No. 954,728

Int. Cl.[2] **C07D** *401/12, 215/12;* **A61K** *31/465*

U.S. Cl. 546—176 **11 Claims**

1. A compound of the formula



wherein R^1 to R^8 each is hydrogen, hydroxy, halogen, lower alkyl containing 1 to 7 carbons, lower alkoxy containing 1 to 7 carbons or lower alkylthio containing 1 to 7 carbons; and acid addition salts thereof.

4,202,986

PREPARATION OF DIPHENYLMETHANE DICARBAMATES AND POLYMETHYLENE POLYPHENYL CARBAMATES WITH LEWIS ACID CATALYSTS INTERCALATED IN GRAPHITE

Edward T. Shawl, Wallingford, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Feb. 12, 1979, Ser. No. 11,300

Int. Cl.[2] **C07C** *125/04*

U.S. Cl. 560—25 **15 Claims**

1. A process for the preparation of diphenylmethane dicarbamates and polymethylene polyphenyl carbamates which comprises reacting an N-aryl carbamic acid ester with a carbonyl compound selected from formaldehyde, paraformaldehyde or trioxane or mixtures thereof at a temperature of from about ambient to about 170° C. in the presence of a Lewis acid having a concentration of at least 0.5 weight percent based on the total reaction mixture and intercalated in graphite in an amount of at least about 1 weight percent.

4,202,987

BIS-ANTHRANILATES

Jurgen Habermeier, Pfeffingen; Roland Moser, Basel, and Wolfgang Seiz, Pfeffingen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

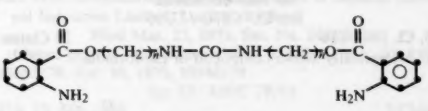
Filed Dec. 4, 1978, Ser. No. 966,424

Claims priority, application Switzerland, Dec. 9, 1977, 15121/77

Int. Cl.[2] **C07C** *101/54;* **C08G** *59/54*

U.S. Cl. 560—49 **4 Claims**

1. A bis-anthranilate of the formula



(I)

in which each n is the number 2, 3 or 4.

4,202,988

PROSTENOIC ACIDS AND ESTERS

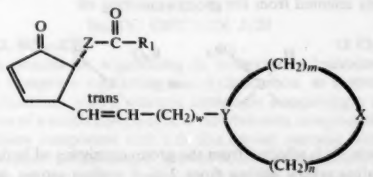
Allan Wissner, Monsey, N.Y.; Martin J. Weiss, Oradell, and Karel F. Bernady, South Sommerville, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Mar. 30, 1977, Ser. No. 782,851

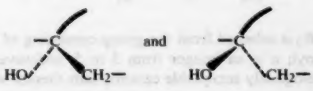
Int. Cl.[2] **C07C** *177/00*

U.S. Cl. 560—118 **47 Claims**

1. An optically active compound of the formula:



wherein R_1 is selected from the group consisting of hydroxy and C_1-C_6 alkoxy; Y is a trivalent radical selected from the group consisting of a moiety of the formula



X is a divalent radical selected from the group consisting of a moiety of the formula

wherein R_4 is selected from the group consisting of C_1–C_7 alkyl, hydrogen; n is zero or an integer from 1 to 4; m is zero or an integer from 1 to 4, with the proviso that the sum of n and m has the value of 2 to 4; w is zero or 1; Z is a divalent radical selected from the group consisting of a moiety of the formula $-(CH_2)p-$, $-(CH_2)_t-O-CH_2-$, and $-(CH_2)_t-S-CH_2-$, wherein p is an integer from 5 to 7, and t is an integer from 3 to 5; the racemic mixture thereof; the mirror image thereof; and the pharmacologically acceptable cationic salts thereof when R_1 is hydrogen.

4,202,989

15-DEOXY-16-HYDROXY-16-SUBSTITUTED PROSTANOIC ACIDS AND CONGENERS

Middleton B. Floyd, Jr., Suffern, N.Y.; Martin J. Weiss, Oradell, N.J.; Charles V. Grudzinskas, Garnerville, N.Y., and Sow-Mei L. Chen, Park Ridge, N.J., assignors to American Cyanamid Company, Stamford, Conn.

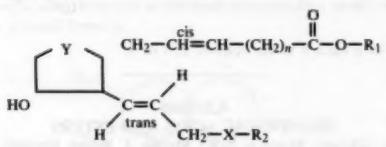
Division of Ser. No. 706,343, Jul. 19, 1976, Pat. No. 4,061,670. This application Aug. 1, 1977, Ser. No. 821,022

The portion of the term of this patent subsequent to Dec. 6, 1994, has been disclaimed.

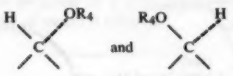
Int. Cl.[2] C07C *177/00*

U.S. Cl. 560—118 **24 Claims**

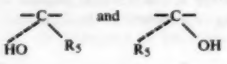
1. An optically active compound of the formula:



or a racemic mixture of that formula and the mirror image thereof wherein R_1 is selected from the group consisting of hydrogen and alkyl having from 1 to 12 carbon atoms, R_2 is selected from the group consisting of alkyl having from 2 to 7 carbon atoms optionally substituted with one or two alkyl groups each having up to 3 carbon atoms; Y is a divalent moiety selected from the group consisting of:



wherein R_4 is selected from the group consisting of hydrogen and alkanoyloxy having from 2 to 6 carbon atoms; X is a divalent moiety selected from the group consisting of:



wherein R_5 is selected from the group consisting of vinyl and cyclopropyl; n is an integer from 3 to 5, inclusive; and the pharmacologically acceptable cationic salts thereof when R_1 is hydrogen.

4,202,990

PROCESS FOR PRODUCING UNSATURATED CARBOXYLIC ACID ESTERS

Fumiki Murakami, Otake; Soichi Teshima, Yamaguchi, and Toshihiko Yokoyama, Otake, all of Japan, assignors to Mitsubishi Rayon Company, Limited, Tokyo, Japan

Filed Jan. 27, 1978, Ser. No. 872,876

Claims priority, application Japan, Feb. 10, 1977, 52/13588; May 16, 1977, 52/56115

Int. Cl.[2] C07C *67/03, 69/54*

U.S. Cl. 560—217 **12 Claims**

1. An ester exchange process, which comprises:

preparing an ester of an unsaturated carboxylic acid by reacting a lower alkyl ester of an α,β-unsaturated, 3–4 carbon atom carboxylic acid with an alcohol higher than the alcohol fragment of said lower alkyl ester over a catalyst selected from the group consisting of (1) chelate compounds of zirconium with at least one β-diketone compound, (2) chelate compounds of calcium with at least one β-diketone compound and (3) mixtures of said calcium and zirconium chelates by an ester exchange reaction.

4,202,991

NOVEL BICYCLOALKANE DERIVATIVES AND THE PRODUCTION THEREOF

Gerhard Sauer, Berlin; Helmut Häuser, Unna; Gregor Haffer, Berlin; Juergen Ruppert, Berlin; Ulrich Eder, Berlin, and Rudolf Wiechert, Berlin, all of Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

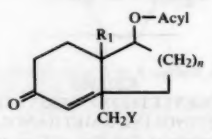
Continuation-in-part of Ser. No. 317,549, Dec. 22, 1972, Pat. No. 4,008,253. This application Dec. 27, 1976, Ser. No. 753,996

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1971, 2165320; Apr. 29, 1972, 2221704; Nov. 2, 1972, 2254175

Int. Cl.[2] C07C *69/145, 69/24*

U.S. Cl. 560—255 **12 Claims**

1. A bicycloalkane of the formula



wherein n is 1 or 2, R_1 is alkyl of 1–4 carbon atoms, Acyl is the acyl radical of an alkanoic acid of 1–10 carbon atoms, Y is $-S-R_2$ or $-SO_m-R_2$, wherein m is 1 or 2, and R_2 is carbocyclic aryl or carbocyclic aralkyl, each up to 12 carbon atoms.

4,202,992

PROCESS FOR PRODUCING HYDROPEROXIDES

Michael E. Coltrin, Champaign, Ill., and Yulin Wu, Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 3, 1978, Ser. No. 883,018

Int. Cl.[2] C07C *179/02*

U.S. Cl. 568—575 **22 Claims**

1. A process for producing cyclohexylbenzene hydroperoxide comprising reacting cyclohexylbenzene and oxygen in the absence of light and in the presence of at least one copper or nickel porphine complex under conditions suitable for producing said hydroperoxide, said conditions including a temperature in the range of about 25° C. to about 200° C. and a pressure in the range of about 0 psig to about 1000 psig wherein said porphine complex has the formula:

where M is Ni (II) or Cu (II), each A is individually selected from the group consisting of hydrogen, alkyl, or aryl radicals, and at least one A is an aryl radical.

4,202,993

METHOD FOR MAKING SUBSTANTIALLY ANHYDROUS ALKALI METAL BISPHENOL SALTS

Tohru Takekoshi, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 9, 1979, Ser. No. 37,440
Int. Cl.[2] C07C *39/16*
U.S. Cl. 568—723 **5 Claims**

1. A method which comprises,

(1) effecting the flash evaporation of water at a temperature in the range of up to 350° C. from a hydrate of a bisphenol salt selected from the class consisting of

(A) a material substantially free of physically associated water consisting essentially of hydrate of bisphenol alkali metal salt, and

(B) an aqueous solution or slurry resulting from the neutralization of bisphenol with a stoichiometric equivalent of an alkali metal hydroxide in the presence of water,

(2) recovering substantially anhydrous residue from the mixture of (1).

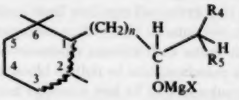
4,202,994

SUBSTITUTED 1-OXYALKYL-2,6,6-TRIMETHYL-CYCLOHEXENE DERIVATIVES, ORGANOLEPTIC USES THEREOF, SYNTHESES FOR PREPARING SAME AND INTERMEDIATES USED IN SAID SYNTHESES

Robert W. Trenkle, Bricktown; Braja D. Mookherjee, Holmdel; Robin L. Kasper, Eatontown, and Manfred H. Vock, Locust, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Jan. 16, 1979, Ser. No. 3,905
Int. Cl.[2] C07F *3/02*
U.S. Cl. 568—824 **3 Claims**

1. A compound defined by the structure:



wherein one of the wavy lines is a carbon-carbon single bond and the other of the wavy lines is a carbon-carbon double bond; n is zero or 1; X is selected from the group consisting of chloro, bromo and iodo; R_4 and R_5 are each the same or different and each is selected from the group consisting of hydrogen, ethyl and methyl, with the proviso that the sum of the carbon atoms in R_4 and R_5 taken together is greater than or equal to 1 and less than or equal to 2.

4,202,995

PRODUCTION OF GLYCOLS

Alec Mee, Middlesbrough, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Mar. 27, 1979, Ser. No. 24,365
Claims priority, application United Kingdom, Mar. 31, 1978, 12662/78; Apr. 10, 1978, 13944/78
Int. Cl.[2] C07C *29/02*
U.S. Cl. 568—860 **7 Claims**

1. A process which comprises producing a glycol by contacting an olefin with oxygen and an aqueous solution which comprises as catalyst copper and/or iron ions, bromide ions and iodide ions, the ratio of iodide ions to bromide ions being in the range 1:1000 to 1.5.

4,202,996

HYDROCARBON ISOMERIZATION PROCESS

Lee Hilfman, Mt. Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 810,323, Jun. 27, 1977, Pat. No. 4,148,759, which is a continuation-in-part of Ser. No. 684,055, May 6, 1976, abandoned. This application Dec. 26, 1978, Ser. No. 973,306
Int. Cl.[2] C07C *5/24, 5/26*
U.S. Cl. 585—377 **12 Claims**

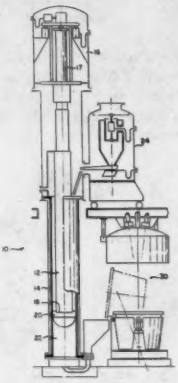
1. A process for isomerizing an isomerizable hydrocarbon which comprises contacting said hydrocarbon, at isomerization conditions, with a catalytic composite comprising a combination of a nickel component, a molybdenum component and a platinum component with a zeolite carrier material wherein said platinum component is present in an amount sufficient to result in the composite containing, on an elemental basis, about 0.2 to about 0.5 percent by weight platinum.

4,202,997

ATMOSPHERIC CONTROL OF FLUX PRE-MELTING FURNACE

Patrick J. Wooding, Moorestown, N.J., assignor to Wooding Corporation, Moorestown, N.J.

Filed Mar. 1, 1977, Ser. No. 773,263
Int. Cl.[2] F27D 7/06
U.S. Cl. 13—31 R 15 Claims



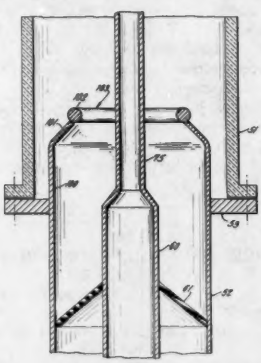
1. In a flux pre-melting furnace for use with an electroslag melting furnace wherein said pre-melting furnace includes a refractory lined crucible and a plurality of graphite electrodes adapted to be inserted into said crucible, the improvement comprising cover means for said crucible, means for creating a seal between said cover means and said crucible and means for controlling the atmosphere within said crucible by removing oxygen therefrom.

4,202,998

AIR ENTRANCE BUSHING FOR GAS-INSULATED BUS

John C. Cronin, Greensburg, Pa., assignor to Gould Inc., Rolling Meadows, Ill.

Filed Jul. 17, 1978, Ser. No. 925,415
Int. Cl.[2] H01B 17/26; H02G 15/22
U.S. Cl. 174—31 R 9 Claims



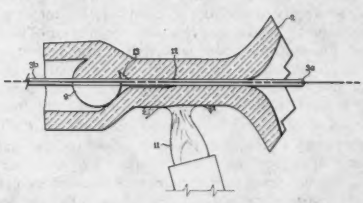
1. A gas-insulated bushing comprising, in combination:
an axially elongated hollow insulation shell filled with gas under pressure;
a conductive mounting flange fixed to one end portion of said insulation shell;
an elongated high voltage conductor extending along the axis of said insulation shell and terminating at the end of said insulation shell opposite said one end portion and being connectable to regions external of said insulation shell;
a gas-filled grounded cylindrical enclosure disposed coaxially with said insulation shell and connected to said flange; said elongated conductor having a portion thereof extending beyond said flange and into said cylindrical enclosure and along the axis of said cylindrical enclosure;
insulation support means fixed within said cylindrical enclosure supporting said elongated conductor with respect to said enclosure and with respect to said insulation shell;
and a hollow conductive shield having one end connected to said flange and to said cylindrical enclosure and being coaxial with said insulation shell and with the axis of said elongated conductor and extending from said one end of said insulation shell and into the interior of said insulation shell; the opposite end of said conductive shield having a diameter substantially smaller than either that of said one end of said shield or that of said insulation shell, the space between said opposite end of said conductive shield and said elongated conductor being filled solely with said gas, whereby the dielectric stress in said gas within said insulation shell in the annular region between said opposite end of said shield and said central conductor when said bushing is in operation is greater than the stress at any other region within said bushing.

4,202,999

FUSED SILICA LAMP ENVELOPE AND SEAL

Robert F. Holle, South Euclid, and Richard L. Hansler, Pepper Pike, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 11, 1978, Ser. No. 895,433
Int. Cl.[2] H01J 5/36
U.S. Cl. 174—50.61 14 Claims



1. An inlead seal assembly comprising:
a fused silica neck extending into a bulb portion and including a passageway therethrough,
a refractory metal wire inlead extending through the passageway into the bulb portion,
a glass bead formed around said wire inlead with wetting, the glass of said bead having a coefficient of expansion intermediate those of the refractory metal and of fused silica,
the silica of the neck being collapsed around said wire inlead without wetting substantially from the bulb portion out to said glass bead, and being engaged by said glass bead with wetting of the fused silica by the glass in order to achieve a hermetic seal, the wetting engagement of glass and fused silica forming a sealing zone concentric with said hermetic seal, and an annular crevice being left between the glass bead and the silica neck on the side of the bulb portion.

4,203,000

CABLE SLEEVE ASSEMBLY

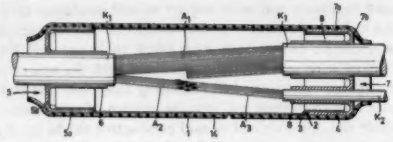
Siegfried Müller, Dahlienstr. 25, 5800 Hagen 8, Fed. Rep. of Germany

Filed May 25, 1978, Ser. No. 909,483

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1977, 2731578

Int. Cl.[2] H02G *15/08*

U.S. Cl. 174—92 **8 Claims**



1. Cable sleeve assembly including an axially split tubular shaped metallic supporting jacket having a pair of opposite ends spaced apart in and extending transversely of the axial direction thereof, an axially extending sleeve head positioned at each of the opposite ends of said jacket, each said sleeve head including at least one axially extending tubular shaped cable inlet part located within and extending in the axial direction of said sleeve head and said supporting jacket, a metallic supporting ring positioned in each said sleeve head and each said supporting ring disposed in form-positive engagement with the adjacent transverse end of said supporting jacket, said sleeve heads including a sleeve part spaced radially outwardly from and laterally enclosing said at least one cable inlet part and said sleeve part retaining its shape while said cable inlet part is shrunk when heat is applied to said sleeve heads, and a shrunk-on plastic hose laterally enclosing said supporting jacket and said sleeve heads for connecting them together, each said cable inlet part is located within and positioned inwardly from the sleeve part of said sleeve head for laterally enclosing a cable passing through the cable sleeve assembly, wherein the improvement comprises said cable inlet part having its axis extending in generally parallel relation with the axis of the sleeve part of said sleeve head, the outer surface of said cable inlet part spaced inwardly from the inner surface of said sleeve part, means interconnecting said cable inlet part and the sleeve part of said sleeve head within which it is positioned for forming an axially extending slot open between the exterior of said sleeve part of said sleeve head and the interior of said cable inlet part for inserting a cable laterally into said cable inlet part, and said plastic shrunk-on hose having an axially extending closable slot therein said means forming said slot comprise a pair of spaced webs extending radially inwardly from said sleeve part of said sleeve head to said cable inlet part with said webs extending in the axial direction of said sleeve part and said cable inlet part and with the space between said webs forming the slot open to the interior of said cable inlet part, each of the surfaces of said webs facing the other and forming the slot has an adhesive layer thereon, and said adhesive layer being meltable when heat is applied, and means for clamping together the facing surfaces of said webs.

4,203,001

APPARATUS FOR ESTABLISHING MULTI-ADDRESS AND CONFERENCE CALL CONNECTIONS

Denis M. Condon, Riverton, N.J., assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jun. 2, 1978, Ser. No. 911,720

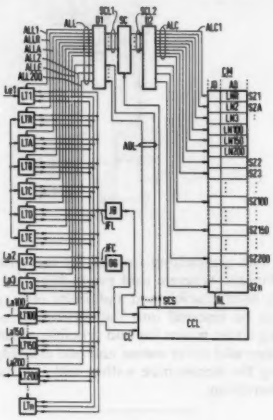
Int. Cl.[2] H04L *11/00*

U.S. Cl. 178—3 **4 Claims**

1. In a switching system of the type in which line terminators are respectively associated with the incoming and outgoing lines, wherein a connection memory is common to all line terminators and which includes a respective storage cell assigned to each line terminator which stores, for the duration of a connection, the allocation between a specified calling line terminator and a specified called line terminator, and wherein devices are provided for scanning the line terminators and for addressing the connection memory, and means for evaluating the address contained in the addressed storage cell of the connection memory to cause interconnection of the line terminators only for the purpose of transmitting a message character, the improvement therein of an arrangement for establishing multi-address connections and conference call connections, said arrangement, in combination with said switching system, comprising:

a plurality of multi-address terminators, a first of said multi-address terminators connected to the inputs of the remaining multi-address terminators for simultaneously transmitting received message characters thereto;

means for entering the address of said first multi-address



terminator in the storage cell in the connection memory assigned to a calling line terminator;

additional storage cells in the connection memory assigned to respective ones of said remaining multi-address terminators;

means for storing the addresses of the called line terminators of a multi-address call in respective ones of said additional storage cells;

scanning means, including decoding means, for scanning said line and multi-address terminators and for scanning said connection memory; and

connection control logic means connected to said line and multi-address terminators, to said scanning means and to said connection memory for controlling scanning and information transfer between calling and called terminators.

4,203,002

CODE CORRELATOR LOOP USING ARITHMETIC SYNTHESIZER

Edward J. Nossen, Cherry Hill, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 11, 1977, Ser. No. 841,058

Int. Cl.[2] H04L *7/08*

U.S. Cl. 375—116 **11 Claims**

1. A circuit for synchronizing a clock signal with an iterative encoded input signal of period T comprising, in combination:

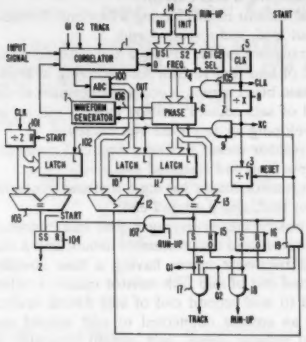
timing means for producing first timing signals;

arithmetic synthesizer means, including phase accumulator means and frequency register means, responsive to said first timing signals for producing the clock signals, said frequency register means storing a frequency number;

waveform generator means responsive to said clock signal

for supplying an iterative encoded output signal having a waveform similar to said input signal but having a period different from the period of said input signal by ΔT;

correlator means for comparing said input signals with said output signals with the relation of the periods thereof being shifted by ΔT at each successive comparison to produce a succession of correlation signals and for producing modifying signals after correlation between said input signals and said output signals has been obtained;



means responsive to said correlation signals for setting said phase accumulator means to a value corresponding to the largest correlation signal; and

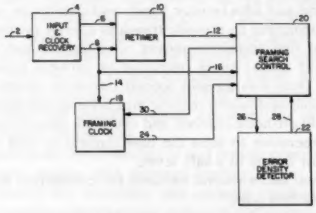
means coupling said modifying signals to the frequency register means for changing said frequency number to maintain the clock signals and the iterative encoded output signal in synchronism with said iterative encoded input signal.

4,203,003

FRAME SEARCH CONTROL FOR DIGITAL TRANSMISSION SYSTEM

Ralph L. Kline, Los Altos, Calif., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Dec. 4, 1978, Ser. No. 965,975
Int. Cl.³ H04L *7/00*
U.S. Cl. 455—111 **6 Claims**



1. In a receiver for recovering digital information from an incoming serial bit stream containing information bits and framing bits, and including a bit clock synchronized with the bit rate of the bit stream and an error density detector, a frame search control which comprises;

a framing clock having an output terminal and an inhibit input terminal, and providing at a framing interval a pulse at said output terminal;

means for sequentially storing n bits from the incoming bit stream, having a first input terminal arranged to accept the digital information from said bit stream, a second input terminal and an output terminal;

a timing arrangement providing at an output terminal a series of n clock pulses at the bit rate following a framing interval when an in-frame condition exists said output terminal being connected to the second input terminal of said storing means whereby bits stored during the preceeding frame are read out and new bits are written in during the present frame;

a comparator having one input connected to the output of said storing means, having a second input connected to receive said bit stream, said comparator providing an error indication for each violation of the framing pattern,

said error indication being applied to said error density detector so as to change the state of the output when an out-of-frame indication occurs, i.e., when the number of error indications at the framing interval exceeds a predetermined ratio; and

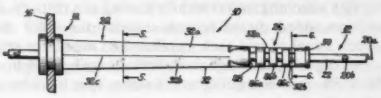
means for limiting the number of pulses in said series of clock pulses, said limiting means having an input connected to the output of said timing arrangement and being responsive to the comparator output and the state of the error density detector so as to provide a count of n when an in-frame condition exists and to increase the count by up to a predetermined number greater than n when both an error indication and an out-of-frame indication occur.

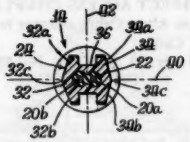
4,203,004

STRAIN RELIEF

Albert R. Cox, Centerville, Ind., assignor to Belden Corporation, Geneva, Ill.

Filed Apr. 20, 1978, Ser. No. 898,170
Int. Cl.² H01R *13/56*
U.S. Cl. 174—135 **17 Claims**



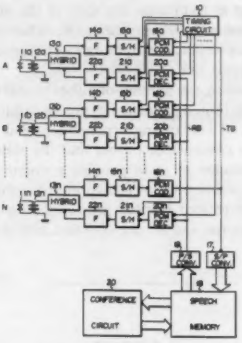


1. A strain relief for use with a cord having a major transverse axis and a minor transverse axis, said major transverse axis having greater magnitude than said minor axis, said strain relief having an axial bore adapted to receive said cord therethrough in close fitting relation therewith, said strain relief defining a head portion adapted for mounting said strain relief on a separate support plate or the like, a flexible tail portion contiguous to said head portion, and a distal end opposite said head portion, said flexible tail portion having a generally H-shaped transverse cross sectional configuration throughout substantially its full longitudinal length so as to define a transverse section modulus about said minor transverse axis which is greater in magnitude than the corresponding transverse section modulus about said major transverse axis, said transverse configuration of said flexible tail portion causing said tail portion to undergo both bending and torsion about its longitudinal axis when a cord disposed within said axial bore is subjected to a bending force tending to bend said cord about a bend axis nonparallel to its said major transverse axis.

4,203,005
DIGITAL TYPE TELEPHONE SYSTEM HAVING A CONFERENCE FUNCTION

Takeo Fukuda, and Hideaki Murayama, both of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jun. 28, 1978, Ser. No. 919,917
Claims priority, application Japan, Jun. 29, 1977, 52-77576
Int. Cl.[2] H04M *3/56*
U.S. Cl. 179—1 CN **12 Claims**

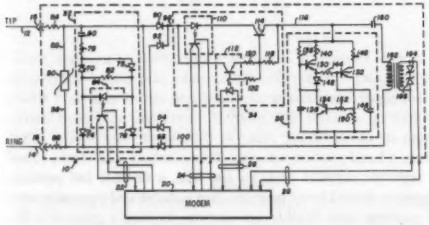


1. A digital type telephone system comprising a plurality of telephone sets for generating speech signals of each member in a telephone conference, means for converting the speech signals into digital speech signals, means for attaching to the digital speech signals alternately opposite polarity signs, means for mutually adding the digital speech signals obtained from the sign attaching means and for storing in a respective address position added digital speech signals except for the digital speech signal of said each member, and means for sending the stored digital speech signals to corresponding telephone sets in the conference according to time slots which are arranged on a time sharing basis.

4,203,006
DIRECT ACCESS COUPLER

Ray C. Mascia, Los Altos, Calif., assignor to Prentice Corporation, Palo Alto, Calif.

Filed Apr. 20, 1978, Ser. No. 898,310
Int. Cl.[2] H04M *11/00*
U.S. Cl. 179—2 C **12 Claims**



1. A direct access coupler capable of withstanding lightning surge transients comprising:

isolation transformer means including a primary winding having a first end and a second end, and a secondary winding;

first capacitor means including a first end which is connected to said first end of said primary winding and a second end;

current source means including

an input lead connected to said second end of said first capacitor means,

an output lead connected to said second end of said primary winding,

second capacitor means having a first end connected to said output lead and a second end,

first resistor means having a first end connected to said second end of said second capacitor means and a second end connected to said input lead, said first resistor for developing a bias current,

second resistor means having a first end connected to said input lead, and a second end,

first transistor means having a base connected to said first end of said first resistor for receiving at least a portion of said bias current, a collector coupled to said second end of said second resistor means, and an emitter for developing an amplified bias current,

third resistor means having a first end connected to said output lead and a second end,

fourth resistor means having a first end connected to said input lead, and a second end,

fifth resistor means having a first end connected to the emitter of said first transistor means, and a second end,

second transistor means having a base coupled to said second end of said fifth resistor means, a collector coupled to said second end of said fourth resistor means, and an emitter connected to said second end of said third resistor means, said second transistor means for causing said off-hook current to flow through said third resistor means,

sixth resistor means having a first end connected to the emitter of said second transistor means, and a second end,

diode means having an anode connected to said emitter of said first transistor means, and a cathode,

third transistor means having a base coupled to said second end of said sixth resistor means, an emitter connected to said output lead and a collector connected to said cathode and to said first end of said first resistor means, said third transistor means being responsive to the level of the potential developed across said third resistor means by said off-hook current and operative to divert a portion of said bias current to maintain said off-hook current at a predetermined magnitude, and

third capacitor means having a first end connected to said output lead, and a second end connected to the base of said second transistor means,

said second and fifth resistor means and said diode means being operative to provide transient energy protection for said first transistor means, said second and third capacitor means being operative to prevent transient energy from driving said second transistor means into saturation, said fourth resistor means being operative to limit said off-hook current, and said sixth resistor means being operative to limit the base current to said third transistor means to a safe level;

a first terminal and a second terminal for connection across a telephone line pair;

first circuit means for coupling signals between said first terminal and said output lead of said current source means; and

second circuit means for coupling signals between said second terminal and said input lead of said current source means, said second circuit means including switching means having an on-hook state wherein said switching means is nonconductive and an off-hook state wherein said switching means is conductive, said switching means being responsive to a control signal and operative to change from said on-hook state to said off-hook state,

whereby an off-hook current of said predetermined magnitude which is voltage independent and of a value at least large enough to apprise the telephone company of the off-hook state of said switching means is conducted through said current source means, whereby AC signals

are coupled between said first and second terminals and said primary winding, and whereby DC signals are blocked from flowing into said primary winding by said first capacitor means.

4,203,007

SYSTEM FOR RECEIVING REMOTE CONTROL SIGNAL IN AUTOMATIC TELEPHONE ANSWERING DEVICE

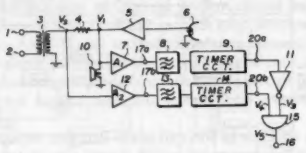
Nobuyoshi Hatori, Hoya, and Eiiji Morigami, Yachiyo, both of Japan, assignors to Iwasaki Tsushinki Kabushiki Kaisha, Japan

Filed Dec. 22, 1977, Ser. No. 863,572

Claims priority, application Japan, Dec. 24, 1976, 51-155012; Dec. 24, 1976, 51-155013

Int. Cl.[2] H04M *1/64*

U.S. Cl. 179—6 E **8 Claims**



1. A system for receiving a remote control signal in an automatic telephone answering device, comprising:

remote control signal detection means for detecting a remote control signal transmitted in operation over a telephone transmission line, said remote control signal detection means comprising a first filter for passing the remote control signal and a first timer circuit responsive to the remote control signal passed by said first filter for developing a detector output signal after a first predetermined time interval;

an output signal sending amplifier for amplifying an output message signal;

message sending means controlled by the detector output signal from said remote control signal detection means for sending a message signal through said output signal sending amplifier to the transmission line in operation in response to the detector output signal;

directional circuit means for extracting the signals flowing through the transmission line in operation and for developing an output signal including the message signal unattenuated and the remote control signal attenuated;

filter means including a second filter and a second timer circuit controlled by the output of said second filter and cooperative with said directional circuit means for filtering the frequency components of the remote control signal from the message signal extracted by said directional circuit means; and

control means connected to said remote control signal detection means, said message sending means and said filter means for inhibiting said message sending means in response to the detector output of said remote control signal detection means during the duration of the output of said filter means.

4,203,008

DIGITAL SIGNALLING RECEIVER FOR RECEIVING PCM TONES

Sorin Cohn-Sfetcu; Jackylene K. Hood, both of Ottawa, and Daniel J. Doyle, Toronto, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Feb. 26, 1979, Ser. No. 15,325

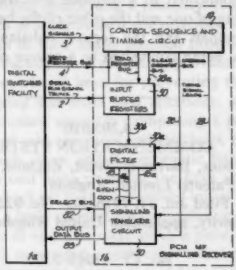
Int. Cl.[2] H04J *3/12*

U.S. Cl. 370—50 **11 Claims**

8. A multifrequency signalling receiver for receiving and translating PCM MF signalling into a signal code format compatible with a controller in a time division multiplex (TDM) switching facility, the signalling receiver comprising:

generating means, connected to by synchronized with the TDM switching facility, for generating a set of steering signals on a repetitive basis;

a time-shared filtering means responsive to the steering signals, for performing a plurality of predetermined pass-



band filter functions with a series of PCM signals received from the TDM switching facility and for generating therefrom a corresponding series of amplitude signals relative each of said filter functions;

translator means, responsive to the steering signals and said amplitude signals, for determining the presence of valid signalling and translating said valid signalling into data signals of a predetermined signal code format.

4,203,009

UNBALANCED/BALANCED CONVERTER CIRCUITS

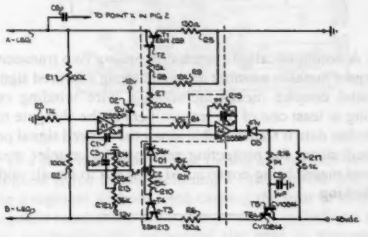
Graham D. Tattersall, Kirkkonammi, Finland, assignor to The Post Office, London, England

Filed Aug. 10, 1978, Ser. No. 932,696

Claims priority, application United Kingdom, Aug. 17, 1977, 34510/77

Int. Cl.[2] H04M *19/06*

U.S. Cl. 179—16 AA **14 Claims**



1. A circuit for converting signals balanced to earth or another potential to unbalanced signals and for converting unbalanced signals to signals balanced to earth or another potential, the circuit comprising:

first and second supply terminals for connection to respective poles of an electrical supply,

a balanced network having first and second balanced input-/output terminals,

an unbalanced network having first and second unbalanced input/output terminals,

a first circuit of controllable impedance connected between the first supply terminal and the first balanced input/output terminal,

a second circuit of controllable impedance connected be-

tween the second supply terminal and the second balanced input/output terminal, and

a control circuit connected to monitor any departure from balance of the potentials of the first and second balanced input/output terminals and to simultaneously change the impedances of the first and second circuits of controllable impedance in opposite directions to restore the potentials to balance, the first unbalanced input/output terminal being connected to a terminal selected from the group consisting of one and the other of the balanced input/output terminals and the second unbalanced input/output terminal being connected to a source of common potential.

4,203,010

COMMUNICATION SYSTEM

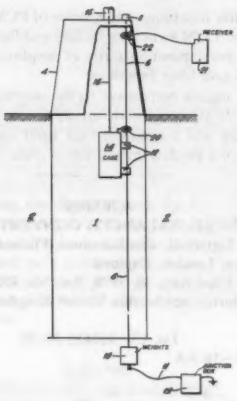
Brian E. Brooks, Burton-on-Trent, England, assignor to Coal Industry (Patents) Limited, England

Filed Jul. 11, 1978, Ser. No. 923,622

Claims priority, application United Kingdom, Jul. 15, 1977, 29793/77

Int. Cl.[2] H04B *5/00*

U.S. Cl. 179—82 **15 Claims**



1. A communication system comprising two transceivers, an elongate metallic member arranged along a desired signal path, toroidal coupler means including a wire winding operably linking at least one of the transceivers to the elongate member, such that data is transmissible along the desired signal path, and shroud means for protecting said toroidal coupler means, the shroud means being constructed so as not to impair said operable linking.

4,203,011

COMPUTER CONTROLLED KEY TELEPHONE STATION SET

Frank A. Coviello, Peekskill, N.Y., assignor to TIE/Communications, Inc., Shelton, Conn.

Filed Jan. 17, 1978, Ser. No. 870,225

Int. Cl.[2] H04Q *5/18*

U.S. Cl. 179—99 M **25 Claims**

1. In a key telephone system having a key service unit for connecting a number of central office lines to a plurality of key telephone station sets and for providing switching control and signalling functions in the key telephone system, at least one key telephone station set comprising:

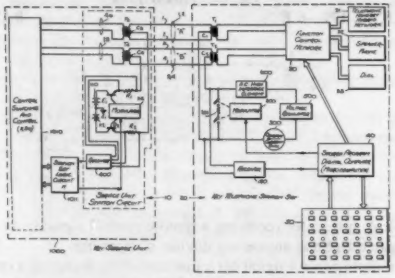
a plurality of switch means operative, when actuated, to generate status signals indicative of desired key telephone services,

at least one conversion means for converting sounds to audio frequency electrical signals and for converting audio frequency electrical signals into sounds,

power receiving and distributing circuit means,

signal receiving circuit means for receiving time-division multiplexed signals from the key service unit and transmitting said time-division multiplexed signals to a stored program digital computer means in said key telephone station set

said stored program digital computer means for generating, in response to said status signals, further time-division multiplexed signals which periodically indicate the status of each of said switch means, and for generating communication circuit control signals in response to the time-division multiplexed signals from the key service unit,



signal transmitting circuit means for receiving said further time-division multiplexed signals from said stored program digital computer means and transmitting said further time-division multiplexed signals to the key service unit,

function control circuit means operative in response to said communication circuit control signals received from said stored program digital computer means to connect said at least one conversion means to either a first communication circuit or a second communication circuit, both said first and second communication circuits connecting said at least one key telephone station set to the key service unit through which said at least one key telephone station set may be connected to any of a plurality of telephone or intercom lines, and

dial signalling means.

4,203,012

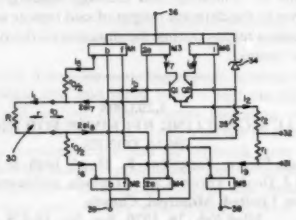
HYBRID CIRCUIT USING CURRENT MIRROR CIRCUITS

Frank S. Boxall, 380 Eleanor Dr., Woodside, Calif. 94062

Continuation-in-part of Ser. No. 815,769, Jul. 14, 1977, abandoned. This application Jul. 10, 1978, Ser. No. 923,365

Int. Cl.[2] H04B *1/58*

U.S. Cl. 179—170 NC **24 Claims**



1. A direct coupled hybrid circuit for providing signal conversion between a balanced bidirectional transmission path and a pair of unbalanced unidirectional transmission paths, said pair

including an incoming and an outgoing transmission path, said hybrid circuit comprising:

first and second loop terminals adapted to be coupled to said bidirectional transmission path;

first and second unidirectional terminals adapted to be coupled to said outgoing and said incoming unidirectional transmission paths, respectively;

a first plurality of current mirror circuit means of a first conductivity type;

a second plurality of current mirror circuit means of an opposite conductivity type;

each of said current mirror circuit means having an input terminal, one or more output terminals, a common terminal and means for supplying currents to said output terminals which are proportional to the current at said input terminal;

the input terminal of the first one of each of said first and second plurality of current mirror circuit means being coupled to said first and second loop terminals, respectively, via first and second impedance elements;

a first output terminal of the second one of each of said first and second plurality of current mirror circuit means being coupled to said first and second loop terminals respectively;

a first output terminal of the first one of said first plurality of current mirror circuit means being coupled to the input terminal of a third one of said second plurality of current mirror circuit means;

a first output terminal of the first and third ones of said second plurality of current mirror circuit means being coupled to the first unidirectional terminal;

a third impedance element connected between the first and second unidirectional terminals;

a fourth impedance element connected between the second unidirectional terminal and the input terminal of the second one of said first plurality of current mirror circuit means; and

a second output of the second one of said first plurality of current mirror circuit means being coupled to the input terminal of the second one of said second plurality of current mirror circuit means.

4,203,013

ALPHANUMERIC CONTROL KEYBOARD WITH DEPRESSIBLE KEYS FOR ELECTRIC OR ELECTRONIC MACHINES

Edouard Serras-Paulet, Casa Nostra - Pech des Treilles, 82240 Puylaroque, France

Continuation-in-part of Ser. No. 735,769, Oct. 26, 1976, abandoned. This application Feb. 1, 1978, Ser. No. 874,553

Claims priority, application France, Jun. 22, 1977, 77 19170

Int. Cl.[2] **H01H** *13/70;* **G06C** *7/02;* **G08C** *1/00;* **B41J** *5/08*

U.S. Cl. 200—5 A **12 Claims**

1. A control keyboard, comprising a first plate having a plurality of apertures, a plurality of keys mounted through said apertures, said keys having flanges of magnetic material on their lower portions for preventing the keys from completely slipping out of said apertures, a second plate arranged under said first plate with a relatively small air gap therebetween and carrying contact means cooperating with said flanges of the keys, said first plate comprising a lower magnetic layer and an upper metal plate forming a magnetic shield for the keyboard, said keys being movable between a first positions in which the flanges are applied onto said lower magnetic layer and kept apart from said contact means and a second position wherein said flanges are applied onto said contact means, said lower magnetic layer and said flanges forming magnetic return means for returning said keys from their second positions to their first positions by magnetic attraction.

10. Alphanumeric control keyboard with depressible keys for electric machines comprising a plurality of keys mounted through apertures in the keyboard and provided with magnetic flanges, said keys in their initial position protruding from an external face of the keyboard and being provided with flanges on lower portions of said keys for preventing the latter from completely slipping out from said apertures, said keyboard consisting of a unitary assembly comprising a plate provided with a plurality of said apertures and said keys, each of which is made of a single piece and the magnetic flanges of which co-operate with said plate retaining the keys applied on said plate when said keys are in their aforesaid initial position, each key comprising a body of electrically insulating material passing through one of said apertures of said plate, on the lower surface of which is secured a transverse metal plate which at the same time forms said flange of said key and contacts said key with conductive elements carried by a plate of insulating material arranged under the plate of the keyboard with a relatively small air-gap therebetween, said keyboard plate comprising a lower magnetic elastomer layer formimg with said transverse metal plate of each key magnetic return means, and an upper metal plate forming a magnetic screen or shield for the keyboard, so that there is no magnetic field on the external face of the keyboard.

4,203,014

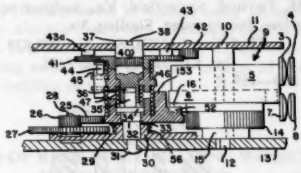
ADJUSTABLE INTERVAL CYCLE TIMER

John L. Harris, Clearwater, Fla., assignor to Deltrol Corp., Bellwood, Ill.

Filed May 19, 1978, Ser. No. 907,802

Int. Cl.[2] **H01H** *43/10*

U.S. Cl. 200—38 R **12 Claims**



11. In a start stop timer, a first timing mechanism having an intermittent drive means including a drive pinion and a gear having a segment without teeth causing the gear to stop when the segment reaches the drive pinion, means including a second timing mechanism for advancing the gear to reengage the pinion, said first timing mechanism including a cam driven by said gear, a switch biased against the cam exerting a resilient force thereon and having a first position and a second position, said cam being formed with a slop engaged for gear engagement without transfer of the switch from one position to the other.

4,203,015

ROLLER BANK SENSOR CONTACT SYSTEM

Lawrence D. Tuchscherer, Goleta, Calif., assignor to General Motors Corporation, Detroit, Mich.

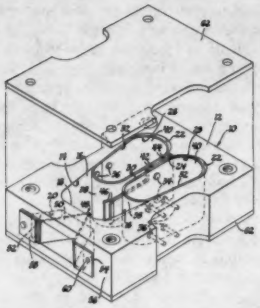
Filed Oct. 5, 1978, Ser. No. 948,963

Int. Cl.[2] **H01H** *35/14*

U.S. Cl. 200—61.45 R **5 Claims**

1. In a sensor having a housing provided with a pair of spaced linear bearing portions, a pair of flexible bands of spring

material disposed between the bearing portions and being forced thereby into generally elongate shape, the adjacent portions of the bands being secured to each other and the remote portions of the bands engaging and being secured to a respective bearing portion, a velocity change of predetermined extent causing the bands to concurrently roll relative to each other along the bearing portions and linearly translate the adjacent secured portions of the bands relative to the bearing portions, the improvement comprising, a pair of first elongated



resilient contact members intermediately secured to the bands and having free end portions extending oppositely therefrom and a pair of flexibly related angular second contact members mounted on the housing in spaced relationship to the first contact members and interengageable therewith, the first contact members laterally separating and the second contact members laterally and flexibly contracting about their apical juncture upon interengagement to thereby substantially eliminate contact bounce.

4,203,016

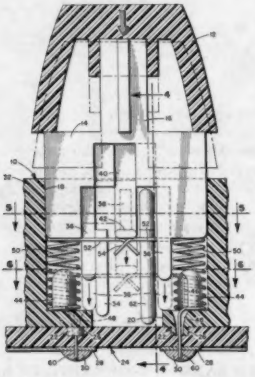
ELECTRIC SWITCH UTILIZING COIL SPRING TORSION BIASING IN SWITCH OPERATION

Robert H. Twyford, Springfield, Va., assignor to Mechanical Enterprises, Incorporated, Sterling, Va.

Filed Nov. 8, 1978, Ser. No. 958,829

Int. Cl.[2] H01H *3/12, 1/06*

U.S. Cl. 200—159 R **19 Claims**



1. A switch comprising:

a housing having a cavity therein opening outwardly of said housing;

a switch actuating plunger reciprocably mounted within said housing cavity;

coil spring means disposed within said housing cavity urging said plunger outwardly of said cavity, said coil spring means having connector means for connecting said switch into an electrical circuit to be controlled and a laterally extending end providing a first contact;

a second contact disposed in said cavity with torsional forces of said coil spring means urging said first contact relative to said second contact; and

stationary cam means carried by said housing urging said laterally extending end relative to said second contact to open and close said contacts incident actuation of said switch between operated and unoperated conditions.

4,203,017

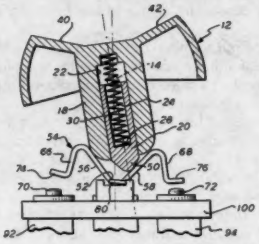
ELECTRIC SWITCH

James Lee, Flanders, N.J., assignor to Integrated Electronics Corporation, Dover, N.J.

Filed Jul. 24, 1978, Ser. No. 927,500

Int. Cl.[2] H01H *1/22, 3/00*

U.S. Cl. 200—339 **3 Claims**



1. In an electric switch having a rotatable knob adapted to be operated by finger pressure and which upon such operation causes a spring biased plunger to exert a switch closing force on a movable switch contact element, the improvement which comprises stop means associated with said plunger forming an abutment which is engaged by said movable switch contact element to prevent movement of said movable contact element to the switch closed position until the knob and plunger have been rotated through a predetermined angle to a preselected position.

4,203,018

METHOD AND APPARATUS FOR ERODING INNER AND OUTER WALLS OF WORK PIECES

Rudolf Schneider, Reinach, Switzerland, assignor to Erowa AG, Reinach, Switzerland

Filed Dec. 13, 1977, Ser. No. 860,069

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1976, 2657357

Int. Cl.[2] B23P *1/12*

U.S. Cl. 219—69 V **9 Claims**

1. A device for eroding a work piece wall by electrical discharge between the work piece and an electrode, the device comprising

a housing,

a working cylinder mounted for axial to-and-fro movement in said housing,

stops for limiting axial movement of said working cylinder in said housing,

a hollow support fixed to one end of said cylinder and formed with a cylindrical chamber co-axial with said working cylinder,

a piston in said cylinder,

a piston rod fixed to said piston and extending through the end of said cylinder remote from said support,

an abutment member forming part of said housing,

a rod-support fixed to said piston rod and cooperating with

said abutment member for limiting axial movement of said piston and said piston rod relative to said housing,

a straight axis shaft adjustably fixed coaxially with said piston and said piston rod for limited axial movement in relation thereto and extending into said cylindrical chamber,

two closure members respectively closing opposite ends of said cylinder whereby selective admission to spaces respectively between said piston and each closure member can move said cylinder in either longitudinal direction,

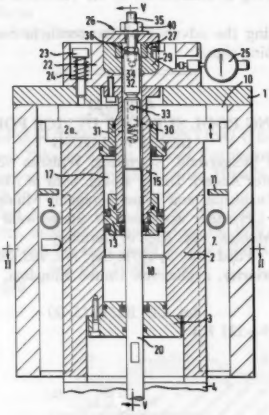
an electrode-holder mounted at the end of said support remote from said cylinder,

bearing means interposed between said support and said electrode holder permitting orbital movement at a variable radius about said shaft axis in a plane to which said shaft axis is perpendicular,

means for effecting said orbital movement, and

a control unit comprising

a cam unit rotatable on said electrode-holder about an axis at said variable radius from said shaft axis, and



a rotor, rotatable on said shaft but axially fixed in relation thereto, coacting with said cam unit for adjusting said variable radius in accordance with the axial position of said rotor relative to said cam unit,

so that by introducing a medium into one of said spaces the said working cylinder is moved in one axial direction, while said rod-support is stationary against said abutment member, for axially advancing said electrode-holder together with said rotor and said shaft until the latter reaches its limit of axial movement, and for then further advancing said electrode-holder without said rotor and said shaft so that said variable radius is simultaneously adjusted, and when said working cylinder reaches its limit of axial movement said medium is effective to retract said piston and said piston rod together with said shaft and said rotor for further adjusting said variable radius without axial movement of said electrode-holder relative to said housing.

4,203,019

METHOD FOR PRODUCING A SEALED CONTAINER BY VACUUM WELDING

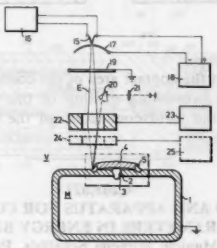
Gerolf Richter, and Scott B. Shanks, both of Berlin, Fed. Rep. of Germany, assignors to Biotronik Mess- und Therapiegeräte GmbH & Co., Berlin, Fed. Rep. of Germany

Filed Apr. 25, 1978, Ser. No. 899,784

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1977, 2719884

Int. Cl.[2] **B23K** *31/02, 15/00*

U.S. Cl. 219—72 **20 Claims**



1. Method for producing a container whose interior is substantially under atmospheric pressure by means of a vacuum welding process, comprising:

(a) assembling the container by welding under vacuum a plurality of wall components while maintaining an opening in the container;

(b) filling the interior of the container through the opening with a medium which is substantially under atmospheric pressure;

(c) sealing the opening of the filled container to be vacuum-tight by means of a first sealing means; and

(d) sealing the container interior from the outside by an additional seal in the form of a cover for the opening by vacuum welding the cover to the container, with the cover bordering the outer surface of the container in such a manner that the cover is welded under vacuum to the container along a line which extends at such a distance from the first sealing means that the sealing effect of the first sealing means is not adversely influenced during the vacuum welding of the cover.

4,203,020

METHOD OF RESISTANCE WELDING WIRES TO A MASSIVE WORKPIECE

Franz Armbruster, Stuttgart; Albano Paoli, Mühlacker; Gerd Bässler, Kornwestheim; Hans-Peter Sitka, Ludwigsburg, and Günter Schmidt, Reutlingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 24, 1978, Ser. No. 908,931

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1977, 2725564

Int. Cl.[2] **B23K** *11/14*

U.S. Cl. 219—93 **14 Claims**

1. A method of joining a wire comprising a core of highly thermally and electrically conductive material, and a coating (13) consisting of a metal with a melting point which is substantially higher than the melting point of the core of said wire,

and a massive workpiece of a material having a melting point which is substantially higher than that of the core of the wire by resistance welding,

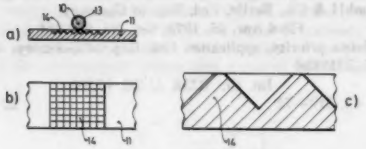
comprising the steps of

providing the surface of a workpiece (11) with at least one bulge or protrusion in the area of the intended weld;

placing said coated wire on the bulge or protrusion of said workpiece

performing a resistance welding operation on said wire

placed on the bulge or protrusion of said workpiece, the bulge or protrusion restricting dissipation of welding heat throughout the workpiece and concentration of said welding heat at the contact area of the coating and the workpiece and preventing melting of the wire core before effecting the weld connection of the coating with the workpiece.



4,203,021

METHOD AND APPARATUS FOR CONTROL OF METHOD PARAMETERS IN ENERGY BEAM WELDING

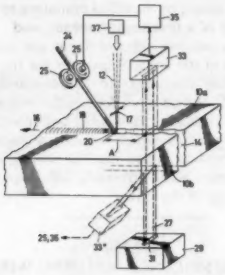
Peter Anderl, Munich; Wilhelm Scheffels, Puchheim; Karl H. Steigerwald, Starnberg; Clauspeter Mönch, Grafrath; Johannes Koy, Germering, and Dieter Konig, Munich, all of Fed. Rep. of Germany, assignors to Steigerwald Strahltechnik GmbH, Munich, Fed. Rep. of Germany

Filed Jul. 29, 1977, Ser. No. 820,331

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1976, 2634341; Jul. 30, 1976, 2634342

Int. Cl.[2] B23K *9/00*

U.S. Cl. 219—121 EB **30 Claims**



1. A method for seam welding a workpiece by means of an energy beam in the case of which the breadth of a separating gap to be closed by welding is measured and the supply of filling material is controlled in accordance with the result of measurement characterized in that the breadth of the joint gap is measured by means of X-ray radiation, which is influenced by the workpiece parts delimiting the joint gap in accordance with the breadth of the latter.

4,203,022

METHOD AND APPARATUS FOR POSITIONING A PLASMA ARC CUTTING TORCH

Richard W. Couch, Jr., and William V. Bailey, both of Hanover, N.H., assignors to Hypertherm, Incorporated, Hanover, N.H.

Filed Oct. 31, 1977, Ser. No. 846,637

Int. Cl.[2] B23K *9/00*

U.S. Cl. 219—121 P **6 Claims**

1. The method of initially positioning a plasma arc cutting torch relative a workpiece, the torch being of the type in which a swirling motion is imparted to an ionizable gas through which the arc discharge takes place and in which water is injected to constrict the arc discharge as it leaves the torch; said method comprising:

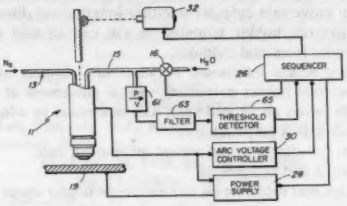
initiating the flow of ionizable gas while the torch is in a retracted position and in which the water supply is turned off;

advancing the torch toward the workpiece;

sensing the vortex pressure within the torch through the water injection conduit and generating a first signal responsive to changes in the vortex pressure;

generating a switching signal only when said first signal corresponds to the abrupt drop in said vortex pressure occurring at attachment of the vortex to the workpiece; and

terminating the advance of the torch in response to said switching signal.



4,203,023

WELDING POOL SUPPORT DEVICE FOR ENERGY BEAM WELDING

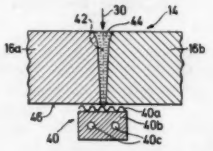
Karl-Heinz Steigerwald, Starnberg; Wilhelm Scheffels, Puchheim; Peter Anderl; Dieter König, both of Munich; Walther Hiller, Puchheim, and Franz Rappold, Munich, all of Fed. Rep. of Germany, assignors to Steigerwald Strahltechnik GmbH, Munich, Fed. Rep. of Germany

Filed May 3, 1978, Ser. No. 902,405

Claims priority, application United Kingdom, May 3, 1977, 18509/77

Int. Cl.[2] B23K *15/00*

U.S. Cl. 219—121 EB **13 Claims**



1. A welding pool support device for energy beam welding in a vacuum, with a metal structure, which on a beam outlet side of a welding seam zone of a workpiece system is put against the beam outlet side and goes up against it at a number of touching points for stopping any movement of melt out of a welding zone, which is produced by the energy beam in the workpiece system and on a relative movement of the energy beam and the workpiece system goes along the weld seam zone, characterised by a supporting structure, which can be so changed in shape that it takes into account uneven parts of the beam outlet side of the workpiece system in the longitudinal direction and also in the transversal direction of the weld seam zone; furthermore the device and the portion of the supporting structure touching the beam outlet side are so irregular and open that the distances between the points of touching from each other and from the parts placed between them, of the supporting structure, permit gases, developing in the welding

zone near the beam outlet side, to freely flow out through the supporting structure and device.

4,203,024

FLUX-CORED ELECTRODE FOR WELDING STEELS IN CARBON DIOXIDE

Igor K. Pokhodnya; Valery N. Shlepakov, and Sergei A. Suprun, all of Kiev, U.S.S.R., assignors to Institut Elektrosvarki Imeni E.O. Patona Akademii Nauk Ukrainskoi SSR, Kiev, U.S.S.R.

Continuation of Ser. No. 708,609, Jul. 26, 1976, abandoned, which is a continuation of Ser. No. 589,847, Jul. 24, 1975, abandoned. This application Mar. 13, 1978, Ser. No. 886,039

Int. Cl.[2] B23K *35/30*

U.S. Cl. 219—146.1 **4 Claims**

1. A flux-cored electrode for welding steels in carbon dioxide, made as a casing from a low-carbon steel and filled with a powder flux consisting essentially of, by weight:

4–8% calcined magnesite,
6–9% feldspar,
4–5.5% calcium fluoride,
14–20% titanium dioxide,
6–10% ferromanganese,
0–2% sodium fluosilicate,
1.5–3% ferrosilicon
and the balance being iron powder.

4,203,025

THICK-FILM THERMAL PRINTING HEAD

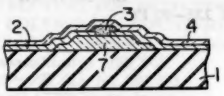
Mitsuo Nakatani; Takashi Kuroki, both of Yokohama; Toshiaki Syozi, Kanagawa, and Yoshiyuki Horibe, Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

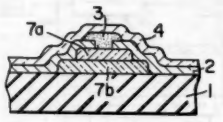
Filed Aug. 17, 1978, Ser. No. 934,368

Claims priority, application Japan, Aug. 19, 1977, 52-98658; Aug. 19, 1977, 52-98659; Aug. 24, 1977, 52-112301[U]

Int. Cl.[2] H05B *1/00*

U.S. Cl. 219—216 **17 Claims**





1. A thick-film thermal printing head comprising:

a substrate;

a heat insulating layer formed, on said substrate, of glass including 10 to 60% by weight of at least one metal oxide selected from the group consisting of Al_2O_3, MgO, ZrO_2, BeO and TiO_2;

plural pairs of electrodes formed over said heat insulating layer and said substrate, one electrode of each pair laterally opposing to the other on said heat insulating layer;

resistors formed between the opposing electrodes of the respective pairs for generating heat; and

an abrasion protective layer formed of glass to completely cover said heat insulating layer and said electrodes and said resistors on said heat insulating layer.

4,203,026

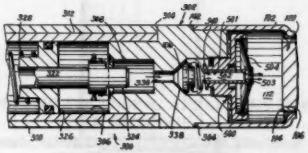
TEMPERATURE RESPONSIVE FLUID DELIVERY CONTROL DEVICE FOR A STEAM CURLING IRON

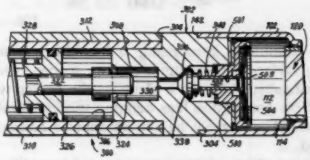
Henry J. Walter, Wilton, and William E. Springer, Stratford, both of Conn., assignors to Clairol Incorporated, New York, N.Y.

Continuation of Ser. No. 768,670, Feb. 14, 1977, abandoned. This application Aug. 7, 1978, Ser. No. 931,719

Int. Cl.[2] H05B *1/00*; A45D *2/36*; F22B *27/00*; A45D *1/04*

U.S. Cl. 219—222 **8 Claims**





1. A steam emitting device comprising a fluid reservoir, a vaporization chamber, first means in said chamber for heating and vaporizing fluid in the chamber, second means for delivering fluid to be vaporized from the reservoir into the chamber, said second means comprising a fluid delivery conduit between the reservoir and chamber, a valve in the conduit, and means for selectively moving said valve between a first closed position preventing fluid flow through said conduit and a second open position allowing fluid flow therethrough and third means for regulating fluid delivery through the valve, the third means comprising first and second elements fixedly attached to one another, the first element being in heat exchange relationship to the vaporization chamber and having the property of changing its shape when heated to a particular temperature, the temperature being the same as or in correspondence to the minimum temperature required of the first means for vaporizing fluid in the chamber; the second element having a fluid delivery passage through which fluid may be delivered from the conduit and through the valve into the vaporization chamber and said second element being movable by the first element in and out of contact with the valve, upon change of shape of the first element due to its temperature in relation to said required minimum temperature; and said second element being moved into contact with the valve by the first element when the first element is below said minimum temperature thereby preventing movement of said valve from its first closed position to its second open position and being moved out of contact with the valve by the first element when the first element is at or above said minimum temperature, to allow said valve to be moved from its first closed position to its second open position so that fluid may flow from said reservoir through said conduit and the delivery passage of said second element into the vaporization chamber, so that the third means allows fluid to be delivered to the vaporization chamber only when the first means is at or above the required minimum temperature.

4,203,027

ELECTRICALLY HEATED HUMIDIFYING APPARATUS

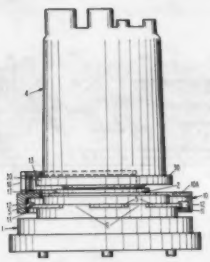
David H. O'Hare; Christopher G. Brickell, and Lindsay G. Spilman, all of Auckland, New Zealand, assignors to Fisher & Paykel Limited, Auckland, New Zealand

Filed Dec. 21, 1977, Ser. No. 862,687

Claims priority, application New Zealand, Mar. 7, 1977, 183517

Int. Cl.[2] H05B 1/00; A61M 15/00

U.S. Cl. 219—275 2 Claims



2. A humidifier comprising: a humidifier heater having a heating surface and circumferentially spaced connection lugs arranged substantially in a plane on the heater with adjacent ends of the connection lugs defining spaces therebetween;

a humidifier element having an annular connection flange; and

an intermediate adaptor securing said humidifier element to said humidifier element, said adaptor comprising a ring and a horse-shoe shaped member affixed to the upper surface thereof;

said ring having circumferentially spaced coacting lugs lying substantially in a plane with adjacent ends of said coacting lugs defining spaces therebetween, the dimensions and positioning of said coacting lugs being such that in use said coacting lugs pass through the spaces between said connection lugs of said humidifier heater and are rotated to a holding position wherein said coacting lugs engage said connection lugs said coacting lugs and connection lugs being engaged to secure the adaptor to the humidifier heater;

said horse-shoe shaped member comprising a partial annular disc spaced above said ring by a partial hollow cylindrical spacer, said disc and spacer defining a gap dimensioned to slidably receive said connection flange of said humidifier element as said humidifier element is slid to and from a heating contact position by movement of said humidifier element between the legs of said horse-shoe shaped member in a plane parallel to the plane containing said partial disc;

said humidifier element being held between the legs of said horse-shoe shaped member in a heating disposition relative to said heating surface by engagement of said partial disc and said connection flange.

4,203,028

APPARATUS FOR TREATING OPTICAL FIBERS BY SPARK EROSION

Joachim Brumann, Cologne, Fed. Rep. of Germany, assignor to Felten & Guilleaume Carlswerk AG, Cologne, Fed. Rep. of Germany

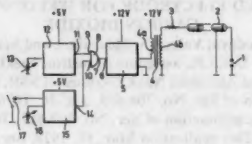
Filed Jan. 12, 1978, Ser. No. 868,832

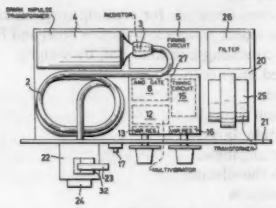
Claims priority, application Fed. Rep. of Germany, Aug. 6, 1977, 2735567

Int. Cl.[2] H05B 7/18; C03C 25/00; G02B 5/14

U.S. Cl. 219—384 14 Claims

1. An apparatus for treating optical fibers by spark erosion, comprising a base; electrical means on said base and forming a spark gap at which optical fibers are to be exposed to spark erosion treatment, including a pair of electrodes which define a gap therebetween, and means for adjusting the spacing between said electrodes to vary the width of said gap; a housing of electrically insulating material surrounding said electrodes; means for arresting an optical fiber to be exposed to such





treatment; a spark-impulse transformer having a primary winding and a secondary winding; an electric charge storing means connecting said spark gap means with said secondary winding; an electric firing circuit having an output connected with said primary winding, and an input; and an electric control circuit for said firing circuit connected to said input thereof and including a multivibrator.

4,203,029

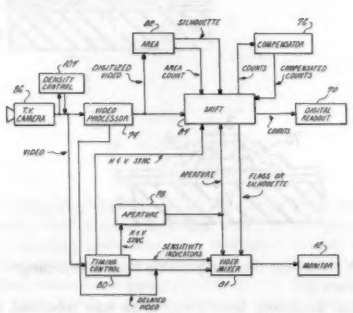
AUTOMATIC OBJECT COUNTER

William R. Kitchener, Huntington, and Stephen L. Sama, Seaford, both of N.Y., assignors to Artek Systems Corporation, Farmingdale, N.Y.

Filed Mar. 6, 1978, Ser. No. 883,996

Int. Cl.[2] G06M 11/04

U.S. Cl. 235—92 PC 55 Claims



1. A counting apparatus for counting objects contained in a sample and comprising:

(a) scanning means focused onto the sample for providing a scanned video output signal;

(b) video processing means receiving said video output signal and for providing therefrom a digitized video signal:

(c) timing control means receiving said video output signal and for providing horizontal and vertical synchronization signals;

(d) aperture generator means receiving said synchronization signals and generating an electronic aperture signal corresponding to a selected area of the sample and representing a closed loop electronic aperture;

(e) shift control means receiving said digitized video signal, said synchronization signals, and said electronic aperture signal, for identifying each object and producing a respective count signal and flag signal for each object identified within the selected area;

(f) area control means receiving said digitized video signal and said electronic aperture signal and generating a count signal proportional to either the total object area or the percent object area respectively within the electronic aperture, said area control means further providing leading and trailing edge silhouette pulses representative of the perimeters of the objects;

(g) counting means selectively receiving said count signals and selectively providing a total count corresponding to the number of identified objects, a total count corresponding to the total area of identified objects, and a total count corresponding to the percent area of the identified objects within the area represented by the electronic aperture signals; and

(h) video display means receiving said video output signal, said flag signal or said silhouette pulses and said electronic aperture signal, and displaying the selected area of the sample with the objects therein and with a flag signal associated with each identified object or with a silhouette surrounding each identified object, said counting apparatus further comprising

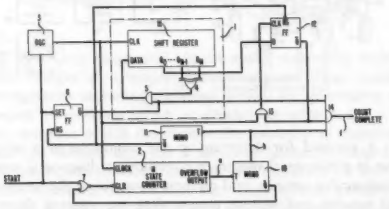
noise detection means coupled to said video processing means for automatically detecting and setting a maximum sensitivity threshold level; silhouette means receiving said digitized video signal and generating leading and trailing edge silhouette pulses for each detected object; area control means receiving said digitized video signal and providing area count signals for each detected object; and percent area control means receiving said digitized video signal and providing percent area signals proportional to the ratio of the detected objects and the area represented by the electric aperture signal.

4,203,030

METHOD AND STRUCTURE FOR DETECTING RECYCLING OF POLYNOMIAL COUNTERS

John C. Moran, Glen Ellyn, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 23, 1978, Ser. No. 953,831
Int. Cl.[2] G11C *19/00*; H03K *21/00*
U.S. Cl. 235—92 CC **7 Claims**



1. In an arrangement comprising a source of pulses (3) and a recycling polynomial counter (1) having N counting stages and 2^N-1 counting states for counting the pulses,

a method of determining when the polynomial counter has recycled after progressing through its 2^N-1 counting states, CHARACTERIZED BY the steps of

storing an indication when a prescribed one of the stages of the polynomial counter assumes a predetermined logic state,

clearing the indication after each group of N of the pulses, and

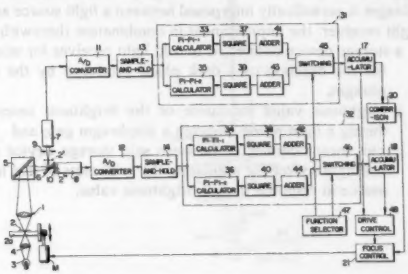
generating a count complete signal after the occurrence of a group N pulses and before the indication is cleared if said indication is not then stored.

4,203,031

AUTOMATIC FOCUSSING APPARATUS FOR MICROSCOPE

Shinichi Kamachi, Hino, and Nagahiro Gocho, Hachiodi, both of Japan, assignors to Olympus Optical Co., Ltd., Japan

Filed Mar. 13, 1978, Ser. No. 885,546
Claims priority, application Japan, Mar. 23, 1977, 52-31071
Int. Cl.[2] G01J *1/20*
U.S. Cl. 250—201 **6 Claims**



1. Automatic focussing apparatus for a microscope having a specimen stage, an optical system and a focussing mechanism therefor to bring the image of a specimen at said stage into proper focus, said apparatus comprising a pair of photoelectric transducer elements disposed respectively short of and beyond the imaging position of a focussing optical system for receiving light images formed short of and beyond the imaging position of said focussing optical system; said focussing optical system including means for simultaneously directing successive picture elements towards said transducer elements; a pair of analog-to-digital converters connected with the output of respective transducer elements for converting an analog output from its associated transducer element which corresponds to each picture element into a digital quantity, a pair of sample-and-hold circuits connected with the converters for holding an output signal in the form of the digital quantity, a pair of calculation circuits for deriving one of the evaluation functions $\Sigma(P_i-P_{i-1})^2$ or $\Sigma(P_i-P_{i-2})^2$ where P_i represents density information of a selected picture element represented by the digital signal, and wherein i represents the location of the picture element P_i such that P_i and P_{i-1} represent the density information of adjacent picture elements while P_i and P_{i-2} represent density information of spaced picture elements a pair of accumulators connected with the respective calculation circuits for accumulating the calculated output, a comparison circuit for comparing the stored content of both accumulators, and a focus control circuit for operating a focussing mechanism in response to an output signal from the comparison circuit, thus adjusting the optical system to bring the image into focus.

4,203,032

ARRANGEMENT FOR PRODUCING A CONSTANT SIGNAL AMPLITUDE IN AN OPTO-ELECTRONIC SCANNING SYSTEM

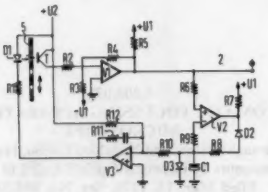
Franz Haunstetter, Augsburg, and Gerhard Koppelmann, Neubaldham, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 12, 1978, Ser. No. 923,995

Claims priority, application Fed. Rep. of Germany, Aug. 4, 1977, 2735245

Int. Cl.[2] G01J *1/32*

U.S. Cl. 250—205 4 Claims



1. In an arrangement for controlling a constant signal amplitude in an opto-electronic scanning system in which a diaphragm is periodically interposed between a light source and a light receiver, the improvement in combination therewith, of:

a storage device connected to said light receiver for storing for the duration of a dark phase produced by the diaphragm,

a brightness value indicative of the brightness received during a light phase, through a diaphragm gap; and

circuit means connected between said storage device and said light source for regulating the brightness of said light source in response to said brightness value.

4,203,033

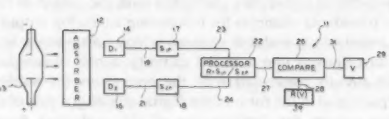
RADIATION ENERGY CALIBRATING SYSTEM AND METHOD

Arnold F. Jacobson, 1141 Petra Pl., Madison, Wis. 53713

Filed Mar. 16, 1979, Ser. No. 21,263

Int. Cl.[2] G01D *18/00*

U.S. Cl. 250—252 8 Claims



1. A radiation energy calibrating system for determining the voltage applied to a source of radiation,

said calibrating system comprising a pair of radiation detectors operated responsive to the radiation output of the source for providing electrical signals that are a function of the radiation intensity,

absorber means between said source and said detectors,

means for determining the ratio between the electrical signals from each of said radiation detectors, and

determining means responsive to the characteristics of each of said detectors and said ratio for determining the voltage applied to said source.

4,203,034

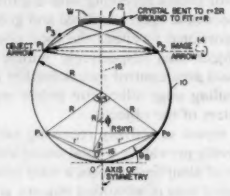
DIFFRACTION CAMERA FOR IMAGING PENETRATING RADIATION

Edward E. Carroll, Jr., Gainesville, Fla., assignor to University of Florida Board of Regents, Tallahasee, Fla.

Filed Jun. 1, 1978, Ser. No. 911,666

Int. Cl.[2] G01N *23/20;* G21K *1/06*

U.S. Cl. 250—280 6 Claims



1. An imaging device for focusing a two dimensional X-ray/gamma ray/neutron radiated object as a two dimensional image by Bragg diffraction comprising at least one single crystal bent to conform to the radius of a Rowland sphere of radius 2R and ground to fit snugly on a Rowland sphere of radius R and in motion relative to an axis normal to the axis of symmetry of the crystal.

4,203,035

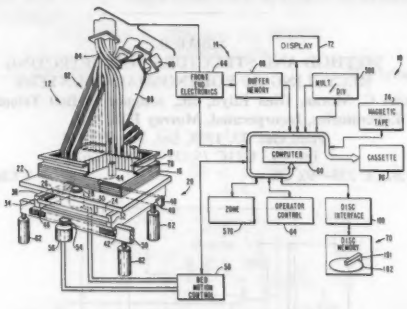
METHOD AND APPARATUS FOR DETERMINING THE CONDITION OF A BIOLOGICAL SPECIMEN

Raymond P. Grenier, Wilmington, Mass., assignor to Baird Corporation, Bedford, Mass.

Continuation of Ser. No. 649,071, Jan. 14, 1976, Pat. No. 4,048,501. This application Jul. 25, 1977, Ser. No. 818,735

Int. Cl.[2] G01T *1/20*

U.S. Cl. 250—363 S 1 Claim



1. A method for determining the condition of a selected organ in a biological specimen containing a diagnostic amount of radioactive sample, said method comprising the steps of:

(a) sensing radioactive events that are emitted from the sample within the specimen, said events sensed by a multi-crystal array having a plurality of unique address locations;

(b) temporarily storing and accumulating the sensed events in a buffer memory;

(c) applying signals defining said accumulated sensed events in said buffer memory to a disc memory;

(d) transferring said signals in said disc memory between said disc memory and a general purpose computer;

(e) generating raw data signals of said sensed events, said raw data signal defining a first raw data curve;

(f) generating a smooth data curve corresponding to said raw data curve;

(g) generating data points defining the maximum positive and negative slopes of the smooth data curve by determining the first derivative of a primary curve of the maximum number of detected events;

(h) generating a second raw data curve by linear extrapolation of the rising side of a primary curve of said first data curve from data points about said data point defining the maximum positive slope to a base line of said first raw data curve and by exponential extrapolation of the falling said of said primary curve of said first data curve from data points about said data point defining the maximum negative slope to said base line of said first raw data curve; and

(i) generating data signals defining the condition of the biological specimen by reduction of the biological specimen by reduction of said second raw data curve to find the centroid of said second raw data curve which is the mean transit time or volume divided by flow in the selected organ undergoing diagnosis; and

(j) applying said data signals to a display for presentation of indica defining the condition of said biological specimen, said method utilizing a sampling rate in the order of 0.05 second.

4,203,036

X-RAY DIAGNOSTIC APPARATUS FOR PRODUCING TRANSVERSE LAYER IMAGES

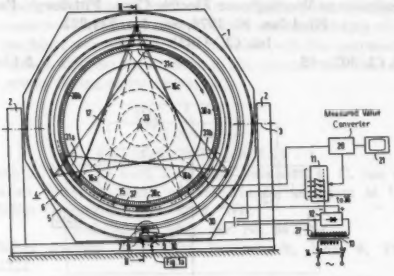
Edgar Tschunt, Rathsberg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 20, 1977, Ser. No. 817,209

Claims priority, application Fed. Rep. of Germany, Nov. 2, 1976, 2650237

Int. Cl.[2] G01N *23/00*

U.S. Cl. 250—445 T **10 Claims**



1. An X-ray diagnostic apparatus for producing transverse layer images of a subject, comprising an X-ray measuring arrangement including an X-ray source for generating a fan-shaped X-ray beam which penetrates the subject, and a radiation receiver which determines the intensity of radiation behind the subject and has a series of detectors, and further comprising means for changing the direction of the X-ray beam, characterized in that the X-ray source comprises an annular anode arrangement with a series of anode regions, and a series of cathodes arranged adjacent the respective anode regions of the anode arrangement, means for switching on electron radiation in steps between at least one cathode and its adjacent anode region to successively change the direction of the X-ray beam, the anode arrangement and the radiation receiver being disposed in such a way that the X-ray beam initially passes laterally by the radiation receiver in the radiation direction and then impinges on respective detectors of the series after transmission through the subject, collimator means inwardly of the series of anode regions and arranged in such a manner that a wide fan-shaped X-ray beam is transmitted from an active anode region through the subject and in such a manner that the X-ray beam is collimated by the collimator means for impingement on respective detectors of the series, and means whereby said collimator means is operative in each successive direction of the X-ray beam for directing the radiation of the X-ray beam from the active anode regions to respective sets of detectors of said series, said radiation receiver having said series of detectors arranged inwardly of the anode regions of said annular anode arrangement so that the anode regions enclose the radiation receiver and the radiation receiver is closer to the subject than the annular anode arrangement.

4,203,037

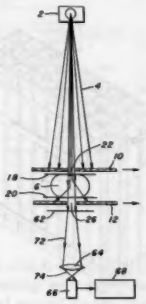
COLLIMATED RADIATION APPARATUS

David Gur; Donald Sashin, and Ernest J. Sternglass, all of Pittsburgh, Pa., assignors to University of Pittsburgh, Pittsburgh, Pa.

Continuation of Ser. No. 820,423, Aug. 1, 1977, abandoned. This application Nov. 6, 1978, Ser. No. 957,016

Int. Cl.[2] G03B *41/16*

U.S. Cl. 250—505 **22 Claims**



1. Apparatus for exposing an object to x-ray radiation comprising,

an x-ray generator,

adjustable object supporting and compressing means disposed generally in the path of x-ray emission from said generator for supporting and compressing said object,

first collimator means having an opening therethrough and being interposed between said x-ray generator and said object supporting and compressing means,

x-ray detecting means disposed on the opposite side of said object supporting and compressing means from said x-ray generator,

second collimator means having an opening therethrough and being disposed between said object supporting and compressing means and said x-ray detecting means,

said x-ray detecting means including

(a) scintillator means for receipt of x-rays passing through said second collimator means opening and emitting light responsive thereto,

(b) an array of self-scanning photodiodes for receipt of said light and converting the same into electrical output signals, and

(c) optical coupling means interposed between said scintillator means and said array of self-scanning photodiodes,

said x-ray detecting means being spaced from said object supporting and compressing means,

signal receiving means operatively associated with said self-scanning photodiode array to receive said electrical signals therefrom, whereby said electrical signals corresponding to said x-ray passage through said second collimator means opening may be stored, processed or displayed,

means for effecting movement of said first and second collimator means relative to and independent of said object supporting and compressing means, and

said means for effecting movement of said first and second collimator means effecting synchronized movement thereof so as to maintain said collimator openings in aligned relationship with respect to said x-ray generator, whereby an object supported and compressed by said object supporting and compressing means will have portions thereof sequentially exposed to x-rays which pass through said opening in said first collimator means and after passing through said object will pass through said aligned opening in said second collimator means and will then impinge upon said x-ray detecting means.

4,203,038

HIGH DENSITY SPENT FUEL STORAGE RACK

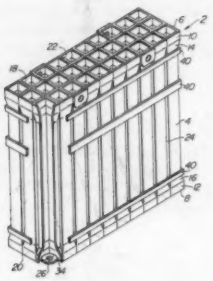
Toshiyori Takahashi, Hitachi; Akihiro Ojima, Takahagi; Teruo Matsumoto, Ibaraki, and Koji Kashiwakura, Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 26, 1977, Ser. No. 845,534

Claims priority, application Japan, Oct. 29, 1976, 51-130914

Int. Cl.[2] G21F *5/00*

U.S. Cl. 250—507 **8 Claims**



1. In a high density spent fuel storage rack including a plurality of neutron absorbing containers each designed to perimetrically encircle a fuel assembly, said containers being arranged so that the rack can store a plurality of fuel assemblies disposed vertically in an array with predetermined spaces between the adjacent fuel assemblies, the improvement wherein each of said containers is provided with enlarged upper and lower end portions which respectively abut against enlarged upper and lower end portions of adjacent containers along their outer peripheries and said abutting end portions being joined at their extremities by edge-welding to one another whereby said containers are formed into a unitary structure providing predetermined spaces between the adjacent containers to serve for the flow of coolant fluid.

4,203,039

VEHICLE SLIDING DOOR POWER DOOR LOCK MECHANISM ACTUATING DEVICE CONTROL SYSTEM

Gary E. Pritchard, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 17, 1978, Ser. No. 934,622

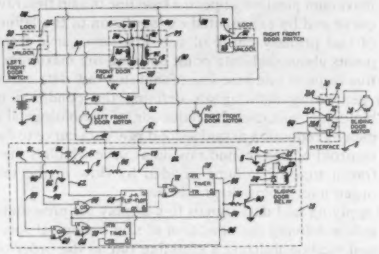
Int. Cl.[2] E05B *65/36*

U.S. Cl. 307—10 R **4 Claims**

1. A vehicle sliding door power door lock mechanism actuating device control system having a memory feature for use with power door lock mechanisms of the type actuated by an electrically energizable actuating device to "Lock" and "Unlock" conditions in response to respective "Lock" and "Unlock" command signals and operative to effect the electrical energization of the lock mechanism actuating device in a direction to actuate the lock mechanism to the "Lock" condition upon each closure of the sliding door subsequent to an occurrence of a "Lock" command signal while the door is open, comprising:

means responsive to the operation of a spring return to neutral type door lock control switch to the "Lock" position for producing and storing a "Lock" command logic signal;

means responsive to the closure of said vehicle sliding door for producing an enabling logic signal;



means responsive to said "Lock" command and enabling logic signals for producing an output electrical signal;

first means responsive to said output electrical signal for effecting the electrical energization of said lock mechanism actuating device in a direction to actuate said lock mechanism to said "Lock" condition, and

second means responsive to said output electrical signal for effecting the removal of said "Lock" command logic signal from storage.

4,203,040

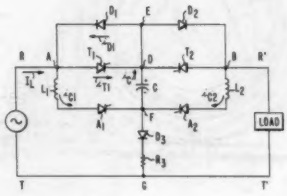
FORCE COMMUTATED STATIC ISOLATOR CIRCUIT

Alberto Abbondanti, and Eric J. Stacey, both of Penn Hills, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 30, 1978, Ser. No. 921,022

Int. Cl.[2] H03K *17/68*

U.S. Cl. 307—65 **8 Claims**



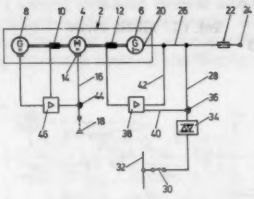
8. An uninterruptible power system (UPS) having a plurality of inverters for supplying AC power to a load through corresponding power lines and a plurality of bilateral static isolators interposed in each of said power lines, respectively, each of said bilateral static isolators comprising: first and second main static controlled switches connected in series-opposition; first and second diode means connected in series-opposition, each of said first and second diode means forming an antiparallel network with one of said first and second main switches and forming a series-conducting network with the other of said first and second main switches; and force commutation means coupled with each of said antiparallel networks; the force commutation means of one of said bilateral isolators being triggered while withholding gating from the associated said first and second main switches for providing soft commutation of a conductive one of said first and second main switches to interrupt the flow of power in the corresponding power line, thereby to disconnect a faulty inverter.

4,203,041

BATTERY/MAINS GENERATOR SET FOR THE PRODUCTION OF INTERRUPTION-FREE CURRENT

Klaus Sachs, Osterode, Fed. Rep. of Germany, assignor to Anton Piller KG., Osterode, Fed. Rep. of Germany

Filed Sep. 1, 1978, Ser. No. 938,882
Int. Cl.² H02J 9/06
U.S. Cl. 307—67 **9 Claims**



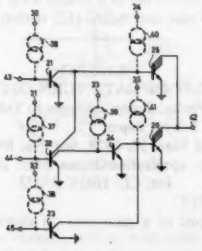
1. A battery/mains generator set for the production of a continuing electricity supply in the event of failure of the mains supply, the set comprising an a.c. machine capable of operating either as a generator or as a motor and, mechanically coupled thereto, a d.c. machine also operable either as a generator or as a motor, the a.c. machine being, in operation, permanently connected, with the mains supply through a static switch, which prevents back-flow of power into the mains, the a.c. machine, when mains driven, being operable as a motor and driving the d.c. machine, which then operates as a generator and charges a battery in accordance with a required I/V characteristic curve, and, on failure of the mains supply, the d.c. machine being operable as a motor powered by the battery to drive the a.c. machine as a generator, thereby providing an output supply to an external load in place of the mains supply, the set also including a current transformer connected to pass the reactive current flowing between the mains and the a.c. machine or the external load and to supply a potential regulator connected to control a controllable exciter winding of the a.c. machine, whereby the a.c. machine will be operated in accordance with the requirement of the external load for reactive power during mains operation.

4,203,042

INTEGRATED CIRCUIT

Claude J. P. F. Le Can, Beek, and Johannes A. C. van den Beemt, Nijmegen, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 31, 1977, Ser. No. 847,161
Claims priority, application Netherlands, Nov. 4, 1976, 7612222
Int. Cl.² H03K 17/56, 19/08, 19/20; G11C 19/28
U.S. Cl. 307—241 **19 Claims**



1. An integrated circuit for processing of binary signals having a plurality of solid state four-pole circuits, each of said circuits comprising:

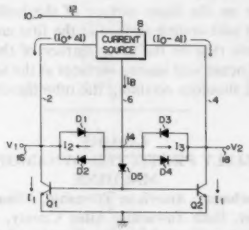
a first signal input line for receiving a bivalent signal;
a second signal input line for receiving a bivalent signal;
a signal output line for outputting a bivalent signal;
a control line for receiving a bivalent control signal for connecting alternatively a single one of said signal input lines to said signal output line;
current injector means being provided for powering each of said signal input lines and said control line with injector current; and
drain means being connected to said signal output line for draining an injector current.

4,203,043

TRISTATE CHANGEOVER SWITCHING CIRCUIT

Masayuki Katakura, Yokohama, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed May 5, 1978, Ser. No. 903,246
Claims priority, application Japan, May 10, 1977, 52-53349; Nov. 15, 1977, 52-136981
Int. Cl.² H03K 17/00, 3/29
U.S. Cl. 307—254 **9 Claims**



1. A switching circuit which comprises:
a current source including an input line for receiving an input signal, first and second signal current lines supplied with differential signal currents $(I_0+\Delta I)$, $(I_0-\Delta I)$ respectively, whose total amount remains constant and one of which has an increment $+\Delta I$ corresponding to a decrement $-\Delta I$ in the other and third signal current line supplied with a constant current;
a first pair of diodes connected in parallel in the opposite directions between the first and third signal current lines and in which the direction of current varies in accordance with the value of current variation ΔI;
a second pair of diodes connected in parallel with each other in the opposite directions between the second and third signal current lines and in which the direction of current varies in accordance with the value of current variation ΔI;
first and second constant current circuits connected to the first and second signal current lines respectively to restrict an amount of input current to the prescribed level; and
first and second output lines which are connected to the first and second signal current lines respectively, and output voltages from which vary in the level with the direction of current passing through the first and second pairs of diodes.

4,203,044

DOUBLE-WALLED ROTOR FOR AN OIL-COOLED ELECTRICAL MACHINE

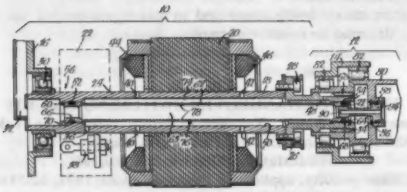
Phillip S. Linscott, Jr., Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Jan. 16, 1978, Ser. No. 869,756
Int. Cl.² H02K 1/32
U.S. Cl. 310—61 **12 Claims**

1. A rotor shaft for an electrical machine comprising:
a hollow rotor shaft having a plurality of holes therein for

transmitting oil, a first and a second end, and sealing surfaces on an inner portion of the hollow rotor shaft at said first and second ends;

a hollow tube within said hollow rotor shaft extending from the sealing surface at the first end to the sealing surface at the second end, thereby defining an annular cavity extending along the hollow shaft between the sealing surfaces;



at least one hole extending through the hollow tube for transmitting oil from the inner surface of said tube to said annular cavity;

a shoulder on the inner surface of the hollow rotor shaft adjacent said sealing surface at the first end; and

a removable ring on the inner surface of the hollow rotor shaft adjacent said sealing surfaces at the second end, said ring and shoulder retaining the tube therebetween.

4,203,045

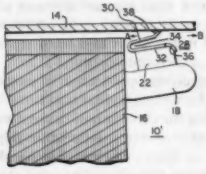
THERMALLY PROTECTED DYNAMOELECTRIC MACHINE

Lloyd W. Buchanan, American Township, Allen County; Noah E. Eberhart, Bath Township, Allen County, and Arthur D. Szabo, American Township, Allen County, all of Ohio, assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 12, 1978, Ser. No. 895,680

Int. Cl.[2] H02K *11/10*

U.S. Cl. 310—68 C **4 Claims**



1. A dynamoelectric machine comprising:

a frame;

a stator core member supported in said frame;

a winding disposed in said stator core;

a thermally responsive protective device disposed against said winding; and

a spring member disposed between and engaged with said frame and said protective device for biasing said protective device against said winding in intimate contact therewith,

said spring member comprising:

a first portion engageable with said protective device and a second portion penetratingly engageable with said frame, said first and second portions being connected at a juncture to form a first angle of predetermined magnitude, said juncture being insertable between said protective device and said frame prior to said first and second portions, said first and second portions providing increased biasing force as said first angle is decreased during progressive insertion of said spring member between said frame and said protective device.

4,203,046

METHOD AND APPARATUS FOR REGULATING THE BRAKE TORQUE OF AN EDDY CURRENT BRAKE

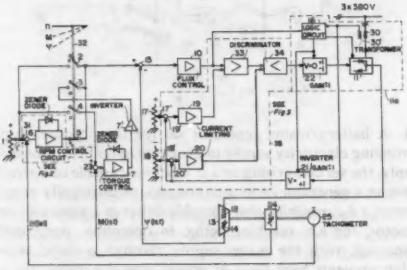
Reimer Homann, Reinheim, and Prodromos Raptopoulos, Gross-Zimmern, both of Fed. Rep. of Germany, assignors to Firma Carl Schenck Aktiengesellschaft, Darmstadt, Fed. Rep. of Germany

Filed Mar. 27, 1978, Ser. No. 890,184

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1977, 2715870

Int. Cl.[2] H02K *49/04*

U.S. Cl. 310—93 **6 Claims**



1. A circuit arrangement for controlling an eddy current brake, comprising rated signal value setting means (**1**), first comparator means (**31**) connected with one input to said setting means (**1**), actual speed representing signal means (**25**) connected to another input of said first comparator means (**31**), speed signal providing means (**6**) connected to said first comparator means, multiposition selector switch means (**32**) connectable to said setting means (**1**) and to said speed signal providing means (**6**), second comparator means (**23**) operatively connectable through said multiposition switch means (**32**) to said setting means (**1**), actual torque signal measuring means (**24**) connected to said second comparator means (**23**), torque signal providing means (**7**) connected to said second comparator means (**23**), third comparator means (**15**) selectively connectable through said selector switch means to said setting means (**1**), to said speed signal providing means (**6**), and to said torque signal providing means (**7**), actual magnetic flux sensing means (**14**) connected to said third comparator means (**15**), energizing coil means (**12**) in said eddy current brake (**13**), d.c. voltage supply means (**11**) operatively connected to said coil means (**12**), control circuit means (**10, 16**) operatively connected to said third comparator means (**15**) and to said d.c. voltage supply means for controlling the supply of energizing voltage from said supply means (**11**) to said coil means (**12**), and current limiting means (**17, 18, 19, 20, 19', 20', 21, 22, 33, 34**) operatively connected in a closed loop circuit to limit the power supply to said coil means (**12**) within presettable limits.

4,203,047

GATE CIRCUIT OF GATE TURN-OFF THYRISTOR

Nagataka Seki, Fuchu, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Tokyo, Japan

Filed Mar. 20, 1978, Ser. No. 888,365

Claims priority, application Japan, Mar. 24, 1977, 52/32396

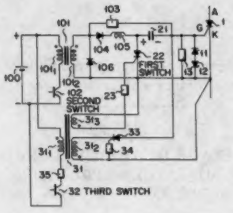
Int. Cl.[2] H03K *17/72*

U.S. Cl. 307—252 C **5 Claims**

1. A gate circuit of a gate turn-off thyristor, which comprises:

a first circuit means connected between the cathode and gate of a gate turn-off thyristor so as to cause a first pulse current of a large rising rate and a narrow pulse width to flow as reverse current from the cathode to the gate of said gate turn-off thyristor when said gate turn-off thy-

ristor is turned off, wherein said first circuit means includes a first switching element adapted to be turned on when said gate turn-off thyristor is turned off, a capacitor adapted to be charged to such a polarity as to cause reverse flow of the discharge current from said capacitor as said first pulse current from the cathode to the gate of said gate turn-off thryistor through said first switching element when said first switching element is rendered conductive, and a pulse transformer connected to a power source through a second switching element adapted to be rendered conductive at a desired instant and adapted to charge said capacitor to said polarity when said second switching element is rendered conductive; and



a second circuit means connected in parallel to said first circuit means so as to cause reverse flow of a second pulse current of a smaller rate of rising and a wider pulse width than said first pulse current in superimposition thereupon from said cathode to gate when said gate turn-off thyristor is turned off, wherein said second circuit means includes one of an additional pulse transformer and a current transformer having a primary winding connected to a power source through a third switching element adapted to be turned conductive when said gate turn-off thryistor is turned off and a secondary winding to cause said second pulse current to flow reversely from the cathode to the gate of said gate turn-off thyristor when said third switching element is rendered conductive.

4,203,048

COIL SUPPORT FOR DISC ROTOR OF CORELESS MOTOR

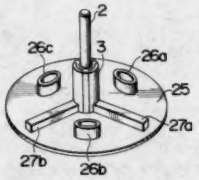
Masaaki Sato, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Japan

Filed Sep. 6, 1977, Ser. No. 830,685

Claims priority, application Japan, Sep. 14, 1976, 51-111165; Sep. 14, 1976, 51-111166; Sep. 25, 1976, 51-115191; Sep. 25, 1976, 51-115192; Sep. 27, 1976, 51-116386; Sep. 27, 1976, 51-116387

Int. Cl.² H01L *41/10*

U.S. Cl. 310—268 **6 Claims**



1. In a rotor of a coreless motor, said rotor being rotatable about an axis of rotation and including a commutator, rotatable about said axis of rotation, and a plurality of coils, the improvement comprising:

a coil positioning member formed integrally with said commutator and extending radially outwardly therefrom, said coil positioning member including a plurality of positioning means, one for each of said coils, said positioning means being located at predetermined locations on said coil positioning member for automatically and positively positioning said coils with respect to said axis of rotation so as to substantially balance said rotor both dynamically and magnetically, said coil positioning member including a plurality of arms and said positioning means including a plurality of guides, each of said guides being carried by a corresponding one of said arms.

4,203,049

ELECTRIC LAMP WITH HYDROGEN GETTER AND HYDROGEN GETTER

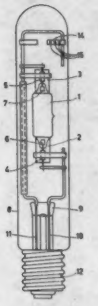
Gijsbert Kuus, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 9, 1978, Ser. No. 914,135

Claims priority, application Netherlands, Jun. 27, 1977, 7707079

Int. Cl.² H01K *1/54*

U.S. Cl. 313—174 **3 Claims**



3. A hydrogen getter for use in an associated electric lamp which comprises a uniform mixture of 65–90% by weight of zirconium powder having a particle size of 100–1000 microns and 35–10% by weight of nickel powder.

4,203,050

GAS DISCHARGE LAMP AND METHOD

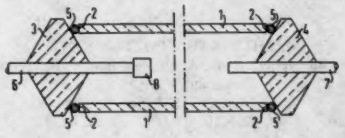
Werner Rech, Taunusstein; Wolfgang Welsch, Wiesbaden, and Eugen Achter, Astheim, all of Fed. Rep. of Germany, assignors to Heimann GmbH, Fed. Rep. of Germany

Filed Jul. 7, 1978, Ser. No. 922,797

Claims priority, application Fed. Rep. of Germany, Jul. 28, 1977, 2734099

Int. Cl.² H01J *61/30*

U.S. Cl. 313—220 **10 Claims**



1. A gas discharge lamp having a glass tube and at least two feed-through conductors,

each of said feed-through conductors being connected in gas-tight relationship with said glass tube at the ends of said tube through a sealing part formed of glass,

said sealing parts each having a conically tapered section extending into the interior of said glass tube, and

a glass solder ring interposed between each of said shaped parts and an end surface of said glass tube for sealing said sealing parts in gas-tight relationship to said glass tube,

said glass solder ring compensating for mechanical stresses brought about by different thermal expansion coefficients of the sealing parts and the glass tube.

4,203,051

CATHODE RAY TUBE APPARATUS

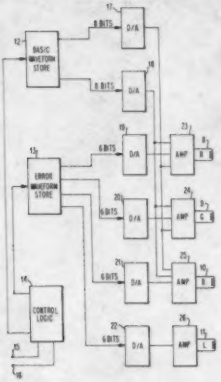
Michael H. Hallett, Chandlers Ford; Michael J. Heneghan, and Brian R. Sowter, both of Winchester, all of England, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 13, 1977, Ser. No. 860,402

Claims priority, application United Kingdom, Dec. 22, 1976, 53583/76

Int. Cl.[2] **H01J** *29/70*

U.S. Cl. 315—13 C **11 Claims**



10. In a display system, the method of providing convergence correction signals to a plural beam color cathode ray tube display which comprises:

providing and maintaining in digital storage basic digital information defining nominal convergence requirements of said color cathode ray tube with respect to various areas of the screen thereof,

operating the convergence means of said display in accordance with said information from said basic storage to provide a nominal convergence of said beams, using the result to define digital information characterizing the error in said nominal convergence, and

using said error information to provide final convergence signals for said display.

4,203,052

SOLID STATE IGNITION SYSTEM

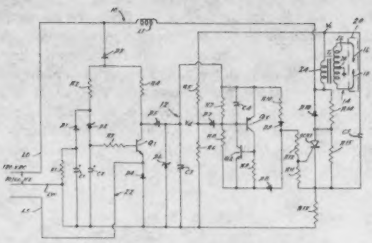
Jon H. Bechtel, Holland, Mich., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Mar. 20, 1978, Ser. No. 888,046

Int. Cl.[2] **H05B** *37/02, 39/04, 41/36*

U.S. Cl. 315—209 CD **38 Claims**

1. A pulse source for generating high frequency and high energy electrical pulses comprising, in combination, a pulse generating circuit adapted to be connected to a source of AC current, said pulse generating circuit including a capacitor, a load connected to said capacitor, means including an inductor effective to charge said capacitor to a voltage level substantially greater than the voltage of the AC source, trigger means actuatable to discharge said capacitor through said load, and capacitor charge voltage monitoring means effective to delay discharge of said capacitor through said load until any capacitance charge in excess of a predetermined level has discharged back through said inductor into the source.



4,203,053

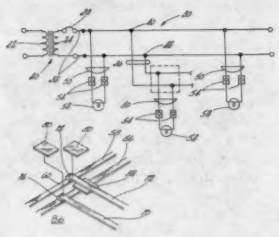
LOW VOLTAGE DISTRIBUTION SYSTEM FOR MINIATURE STRUCTURE

Franziska M. Shepard, 333 E. Las Flores, Santa Maria, Calif. 93454

Filed Jan. 24, 1978, Ser. No. 872,022

Int. Cl.[2] **H05B** *39/00;* **A63H** *33/42*

U.S. Cl. 315—254 **14 Claims**



1. A low voltage distribution system for a miniature structure comprising

means for producing a low voltage signal;

a main bus bar formed of a conductive metal foil top layer and an adhesive bottom layer, said conductive metal foil having a pair of elongated bus bar strips each having a selected geometrical dimension across the width thereof, said strips being positioned in spaced parallel relationship wherein the spacing between the parallel center lines of each elongated bus bar strip is of a predetermined distance which is at least equal to said geometrical dimension and said adhesive layer being adapted to attach the main bus bar to a selected portion of a miniature structure with the conductive metal foil exposed;

means for connecting the low voltage signal to the conductive metal foil layer and producing a voltage potential across said strips; and

at least one bi-prong removable electrical fastening device formed of a pair of spaced conductive fastening members each of which are electrically connected to an output terminal, each of said fastening members terminating in an elongated tapered cutting edge, said tapered cutting edges being in spaced parallel relationship and having a dimension therebetween substantially equal to said predetermined distance, and which, when urged into fastening engagement with a said miniature structure, are adapted to pierce, form an elongated slit in and parallel to the center line of each bus bar and be driven through each of the bus bar strips of the main bus bar forming an electrical connec-

tion therewith and into fastening engagement with said selected portion of a said miniature structure located under the adhesive layer, and being adapted to terminate said electrical connection with each of the bus bar strips upon removal of the fastening member from fastening engagement with said selected portion of a miniature structure by slideably withdrawing the tapered edges from each bus bar strip leaving a slight elongated slit therein while enabling the strips to maintain a voltage potential thereacross independent of the elongated slit.

4,203,054

CORRECTION FACTOR SIGNALS FOR CATHODE RAY TUBES

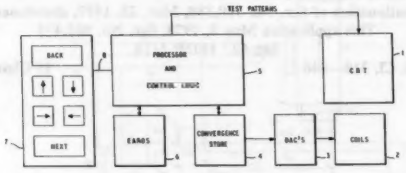
Brian R. Sowter, Winchester, England, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 8, 1978, Ser. No. 940,695

Claims priority, application United Kingdom, Sep. 15, 1977, 38584/77

Int. Cl.[2] H01J *29/70, 29/76*

U.S. Cl. 315—368 **14 Claims**



1. In cathode ray tube apparatus in which the screen is notionally divided into a plurality of areas and which includes storage means arranged in operation to contain correction factor signals for each area of the screen, the method of generating correction factor signals comprising the steps of displaying test patterns at a number of points of the screen less than the number of said areas, adjusting the displayed test patterns to remove distortions thereof, deriving correction factor signals for the points at which the test patterns are displayed in accordance with the adjustments effected, and using the derived correction factor signals to determine correction factor signals for each area of the screen.

4,203,055

HIGH VOLTAGE POWER SUPPLY SYSTEM

Derek Chambers, Bedford, N.H., and Hugh C. Masterman, Littleton, Mass., assignors to Raytheon Company, Lexington, Mass.

Division of Ser. No. 758,974, Jan. 13, 1977, which is a continuation of Ser. No. 573,710, May 1, 1975, abandoned. This application Feb. 27, 1978, Ser. No. 881,978

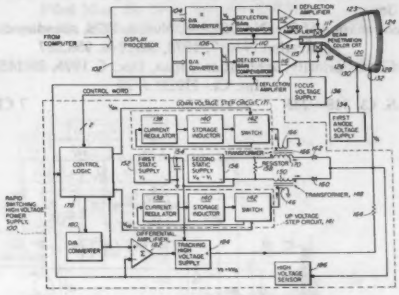
Int. Cl.[2] H01J *29/80*

U.S. Cl. 315—375 **15 Claims**

1. In combination:

a beam penetration cathode-ray tube having an accelerating electrode and a screen electrode; and

means for producing signals for deflecting the beam of said beam penetration cathode-ray tube in response to input beam position determining signals, the amplitude of said deflecting signals for a fixed amplitude of said input beam



position determining signals being determined in response to the voltage applied to said screen electrode.

4,203,056

VERTICAL DEFLECTION CIRCUIT

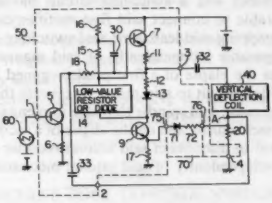
Takashi Itoh, Yokohama, Japan, assignor to Hitachi, Ltd., Japan

Filed Jan. 17, 1979, Ser. No. 4,221

Claims priority, application Japan, Jan. 20, 1978, 53-4378

Int. Cl.[2] H01J *29/70*

U.S. Cl. 315—389 **4 Claims**



1. A vertical deflection circuit comprising:

a vertical deflection coil;

an amplifier for supplying a vertical deflection current to said vertical deflection coil in opposite directions, said ammplifier being a vertical output stage in which the amplifier degree for the first period when the vertical deflection current flows through said vertical deflection coil in one direction is higher than that for the second period when the vertical deflection current flows through said vertical deflection coil in the other direction opposite to the one direction;

a driving stage for driving said vertical output stage;

sampling means connected in series to said vertical deflection coil for sampling the vertical deflection current thereby generating a sample signal corresponding to the sampled vertical deflection current;

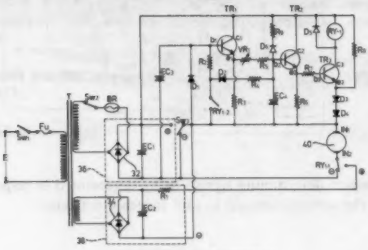
negative feedback means for negatively feeding back said sample signal to said driving stage; and

negative feedback amount-correcting means connected to said sampling means for reducing the sampling signal negatively fed back in the second period to a level lower than the sampling signal negatively fed back in the first period, whereby the amplification degree of the vertical output stage for the first period being thus made equal to that for the second period.

4,203,057
CONTROL MEANS FOR THE WIRE WRAPPING MACHINE

Katsuyuki Totsu, No. 4-7, 3-chome, Oshiage, Sumida-ku, Tokyo, Japan

Continuation of Ser. No. 737,078, Nov. 1, 1976, abandoned. This application Nov. 7, 1978, Ser. No. 958,557
Claims priority, application Japan, Dec. 6, 1975, 50-145380
Int. Cl.[2] H02P *3/10*
U.S. Cl. 318—285 **7 Claims**

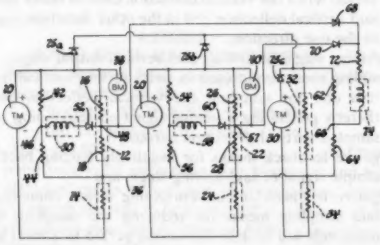


1. A control system for a wire wrapping machine having a lead wire wrapping spindle supported in an outer sleeve for rotation in one direction to wrap said lead wire and in an opposite direction to reposition said spindle with respect to said sleeve, the rotation of said spindle in the opposite direction being limited by engagement with a ratchet mechanism, comprising a reversible DC motor for driving said spindle, a first rectifier circuit connected to a source of current for supplying current of a predetermined polarity, a second rectifier circuit connected to the source of current for supplying current of an opposite polarity and a switching circuit having a manual control operable to connect said first rectifier circuit to said motor for wrapping said lead wire, said switching circuit being thereafter operable independently of said manual control to connect after the elapse of a first predetermined interval said second rectifier circuit to said motor to reverse the rotation of said motor to cause said spindle to rotate into engagement with said ratchet mechanism, and on the elapse of a second predetermined interval to disconnect said second rectifier circuit from said motor independently of said ratchet mechanism.

4,203,058
FAILURE DETECTION CIRCUIT FOR DYNAMIC BRAKING SYSTEM

Stephen S. Chen, Downers Grove, Ill., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 25, 1978, Ser. No. 936,781
Int. Cl.[2] H02H *3/04, 3/08, 3/12*
U.S. Cl. 318—380 **4 Claims**



1. In a dynamic braking system for a vehicle having first and second traction motors controlled to substantially the same nominal voltages and connectable in series with first and second dynamic braking grids, respectively, the first dynamic braking grid including two series resistors connected at a first junction, and a blower motor connected across one of the resistors of the first grid for driving a blower to cool the grids when current is applied to the said first grid, a control circuit for detecting failure of the blower motor comprising

a first pair of reference resistors serially connected across the two first grid resistors to form a bridge circuit therewith, first sensor means connected across said bridge circuit to detect a first signal developed due to bridge imbalance only when the blower motor experiences an open circuit condition,

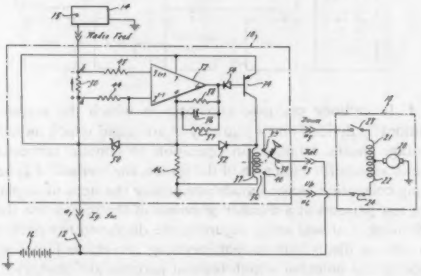
a second pair of reference resistors joined at a second junction and connected across the second grid to provide a reference potential at the second junction, second sensor means connected between the said first and second junctions to detect a second signal that is developed between said junctions only when the blower motor experiences a short circuit condition, and

a detector circuit responsive to the first and second signals for generating a control signal when either type of motor failure occurs.

4,203,059
ELECTRONIC CURRENT SENSOR AND CONTROLLER FOR AUTOMATIC POWER ANTENNA

Richard A. Kraus, Berkley, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Continuation of Ser. No. 780,380, Mar. 23, 1977, abandoned. This application May 3, 1978, Ser. No. 902,473
Int. Cl.[2] H02P *1/18*
U.S. Cl. 318—446 **18 Claims**



1. A solid state electronic current sensor and controller circuit for sensing the energization of an automobile radio receiver device electrically powered from a potential source and for controlling an extensible and retractable power driven antenna unit remotely located from said receiver device upon energization and deenergization of the receiver device, said current sensor and controller comprising

a first resistor adapted to be connected in series between one side of said potential source and said receiver device;

a high gain, differential operational amplifier having a pair of signal input terminals connected across said first resistor, a signal output terminal and a pair of operating potential supply terminals including a high potential supply terminal and a supply return terminal of which the high potential terminal is connected to one side of said first resistor adjacent said source;

an electrical relay having a coil and a set of switch contacts for connection to said power driven antenna unit to control the extension and retraction thereof upon energization and deenergization of said relay;

an output control transistor having an input control electrode coupled to the output terminal of said amplifier and a pair of output electrodes one of which is connected to the high potential supply terminal of said amplifier and the

other to one side of said relay coil in current controlling energization relation with said relay coil; and

a suppression circuit for protection of the operational amplifier and said control transistor from high voltage transients presented to the input of the controller including,

a Zener diode connected between the said return supply terminal of said operational amplifier and the side of said first resistor connected to the said one side of said potential source and

a second resistor connected to the return supply terminal of the amplifier and the other side of said relay coil returned to the other side of said potential source.

4,203,060

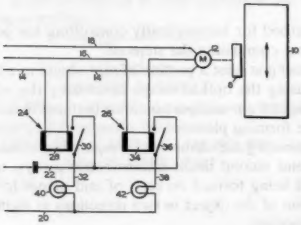
VISUAL FEED CONTROL ASSEMBLY FOR CARRIAGE-FED SAWMILL SAWS

Russell A. Heitzman, 349 W. 14th St., McMinnville, Oreg. 97128

Filed Dec. 16, 1977, Ser. No. 861,572

Int. Cl.[2] G08B *21/00*

U.S. Cl. 318—474 **3 Claims**



1. The combination with an electric motor driven sawmill saw fed by a manually operated variable speed reciprocating log carriage, of a visual or audible signal feed control assembly consisting of:

(a) a three-phase electric circuit electrically connected to the saw motor,

(b) first and second trip current relay means each comprising a solenoid and an associated electric switch,

(c) a second electric circuit,

(d) first and second electrically operated visual or audible signal means in the second electric circuit,

(e) the solenoid component of the first relay means being connected directly in series circuit relationship in one of the lines of the three-phase electric circuit, and the switch component thereof being in series circuit relationship with the first signal means in the second electric circuit,

(f) the solenoid component of the second relay means being connected directly in series circuit relationship in another of the lines of the three-phase electric circuit and the switch component thereof being in series circuit relationship with the second signal means in the second electric circuit,

(g) the first trip current relay means being preset to operate at a predetermined minimum saw motor amperage load, thereby energizing the first electric signal means to signal attainment of minimum log carriage feed rate, and

(h) the second trip current relay means being preset to operate at a predetermined maximum saw motor amperage load, thereby energizing the second electric signal means to signal exceeding maximum log carriage feed rate.

4,203,061

ROTATIONAL SPEED INDICATING APPARATUS

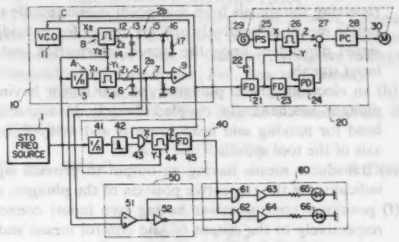
Hiroshi Minakuchi, Kadoma, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Japan

Filed Mar. 28, 1978, Ser. No. 890,911

Claims priority, application Japan, Mar. 30, 1977, 52-36524

Int. Cl.[2] H02P *7/28*

U.S. Cl. 318—490 **15 Claims**



1. Apparatus for visually indicating the deviation of the speed of a motor from a standard setting speed, comprising:

a variable frequency standard phase signal source for generating a standard phase signal at a manually selectable continuously variable frequency and driving said motor at variable speeds;

a standard frequency signal source;

means for generating a speed related signal at a frequency related to the speed of rotation of said motor;

a phase comparator for detecting a phase difference between said standard phase signal and said speed related signal for correcting the speed of said motor in accordance with the detected phase difference to reduce said phase difference substantially to zero;

a mixing circuit connected to said variable frequency and standard frequency signal sources for generating a beat frequency signal; and

visual indicating means responsive to said beat frequency signal for visually indicating said beat frequency.

4,203,062

MACHINE TOOL CONTROL SYSTEM

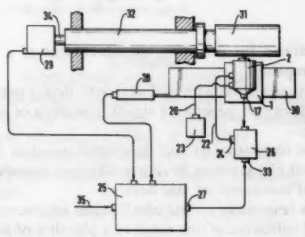
Roland Bathen, 31 Hölderlinstrasse, Weissach, Fed. Rep. of Germany

Filed Jun. 1, 1978, Ser. No. 911,610

Claims priority, application Fed. Rep. of Germany, Jun. 2, 1977, 2724808

Int. Cl.[2] G05B *19/24*

U.S. Cl. 318—571 **5 Claims**



1. A control system for a machine tool including a spindle for rotating a workpiece to be machined and a cutting head mounted for relative movement towards and away from the axis of the spindle comprising:

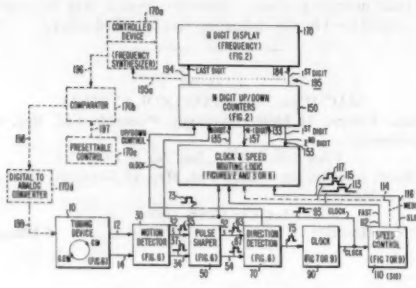
(a) spindle transmitter means for providing a signal indicative of the angular position of the machine tool spindle,
(b) position transmitter means for providing a signal indicative of the relative axial position of the machine tool cutting head and the workpiece rotatable by said tool spindle,
(c) control means for storing information representing desired angular and longitudinal parameters of the desired workpiece shape and including first and second inputs for receiving the signals from said position and spindle transmitter means respectively and an output for providing a signal dependent upon the stored information and said input signals,
(d) an electromagnetic plunger-type coil motor having its plunger mechanically coupled directly to said cutting head for moving said head towards and away from the axis of the tool spindle,
(e) transducer means having an output to provide signals indicative of the respective position of the plunger, and
(f) positional control means having two inputs connected respectively to the output of said control means and the output of said transducer means, an output connected to the plunger coil, and comparator means which compares these signals arriving at the two inputs and, in the event of any difference existing between the actual value and the nominal value, emits a correcting signal to the plunger coil to determine the position of the cutting head.

4,203,063

MOVEMENT DETECTING APPARATUS AND METHOD

Paul Loeb, Glassboro, and Irving P. Magasiny, Cheltenham, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Aug. 29, 1977, Ser. No. 828,752
Int. Cl.[2] G05B *19/28*
U.S. Cl. 318—603 **19 Claims**



1. Apparatus for detecting the movement of a moveable device comprising;

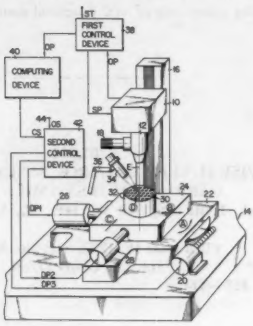
a. means associated with said device to detect movement of said device to generate a signal indicative of said movement;
b. means responsive to said movement signal to generate a train of clock pulses having a rate corresponding to the rate of movement of said device;
c. means responsive to said clock pulses to generate a speed signal indicative of one range of a plurality of preselected ranges of said clock pulses; and
d. counter means responsive to said clock pulse and said speed signal to provide a count that manifests the displacement of said moveable device and the rate of movement at which said device is moved.

4,203,064

METHOD FOR AUTOMATICALLY CONTROLLING THE POSITION OF SMALL OBJECTS

Etsuji Suzuki; Tomio Kashihara; Susumu Hashimoto, all of Yokohama; Ken Watanabe, Kawasaki, and Tsuyoshi Kodama, Katano, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Japan

Filed Apr. 5, 1977, Ser. No. 784,778
Claims priority, application Japan, Apr. 6, 1977, 52-50352
Int. Cl.[2] G05B *1/06*
U.S. Cl. 318—640 **2 Claims**



1. A method for automatically controlling the position of a small object comprising the steps of:

(a) exposing at least a portion of said object to a light beam;
(b) focusing the optical image created by the reflection of said light from said portion onto first and second separate image forming planes;
(c) illuminating the elements corresponding to said image on first and second linear photoelectric arrays, one of said arrays being formed on each of said planes to detect the position of the object in two directions at right angles to one another;
(d) sequentially scanning the elements of said first and second linear arrays to produce an output pulse from each element corresponding to the illuminated or non-illuminated state of each element;
(e) sequentially detecting the output from each of said elements;
(f) digitally computing the number of non-illuminated elements on each side of said optical image for each linear array from said outputs;
(g) generating first and second correction signals to move said object in the direction of said first and second arrays, respectively, to a point where a predetermined number of non-illuminated elements appears on each side of said optical image for each linear array; and
(h) moving said object to said point in response to said first and second correction signals.

4,203,065

STATE OF CHARGE SENSING MEANS

Darryl R. Whitford, Bedford Park, Australia, assignor to The Flinders University of South Australia and The Minister of Transport, both of, Australia

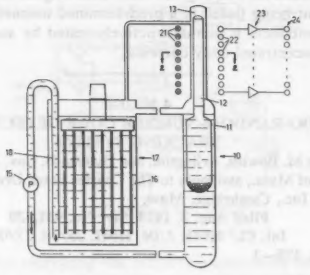
Filed Jul. 6, 1978, Ser. No. 922,376
Claims priority, application Australia, Jul. 8, 1977, PD0759
Int. Cl.[2] H02J *7/00*; H01M *10/48*
U.S. Cl. 320—43 **11 Claims**

1. State of charge sensing means for the sensing of the state of charge of a rechargable battery cell having a liquid electrolyte the density of which varies in response to the state of charge, comprising:

an electrolyte recirculating circuit comprising an inlet conduit the mouth of which opens into the cell below the

electrolyte level, a container, a return conduit extending from the container back to the cell, and a pump operable to recirculate said electrolyte through said circuit,

a hydrometer float in said container having an upwardly extending opaque neck the height of which above electrolyte level is a function of electrolyte density,



a light source assembly on one side of the opaque neck and a light receiving assembly on the other side of the opaque neck, arranged so that light energy from the light source assembly received by the receiving assembly is a function of said height of the neck,

and slave means connected to and controlled by the light receiving assembly.

4,203,066

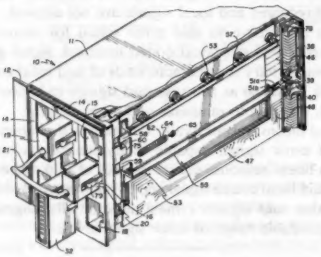
ACCESS MODULE

Josef J. Buck, Minneapolis, Minn., assignor to Magnetic Controls Company, Minneapolis, Minn.

Filed Dec. 1, 1977, Ser. No. 856,503

Int. Cl.[2] G01R *31/02*

U.S. Cl. 324—51 **13 Claims**



1. A digital patch and access module for use in a patch and access assembly having a series of said modules in side-by-side relationship comprising:

a first plurality of separate conductor leads;

a second plurality of separate conductor leads;

electrical switch means connected between said first plurality of separate conductor leads and said second plurality of separate conductor leads for selectively simultaneously connecting said first and second plurality of separate conductor leads and simultaneously disconnection said first and second plurality of separate conductor leads;

access means for providing monitoring access to a selected plurality of said separate conductor leads when said first and second plurality of conductor leads are electrically connected;

a connection for a power source independent of said plurality of conductor leads;

a selectively removable monitor plug adapted for connection with said access means, said monitor plug including monitor means adapted for monitoring connection with said selected plurality of said separate conductor leads and means adapted for electrically connected said power source conection and said monitor means.

4,203,067

APPARATUS FOR DETERMINING THE WATER CONTENT OF ISOTROPIC MATERIALS BY MEANS OF MICROWAVE ABSORPTION

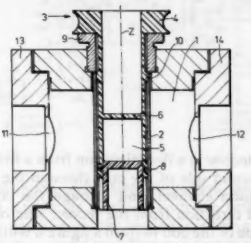
Hans G. Fitzky, Odenthal-Hahnenberg; Franz Schmitt, Cologne; Norbert Bollongino, Leichlingen, and Helmut Rehrmann, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 15, 1978, Ser. No. 886,693

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1977, 2714094

Int. Cl.[2] G01R *27/04*

U.S. Cl. 324—58.5 C **8 Claims**



1. An apparatus for measuring the water content of a sample of an electrically non-conductive isotropic material, comprising:

a cylindrical single mode transmission cavity resonator excitable in the TM_{010} mode and having protective tube extending centrally axially through the entire resonator cavity perpendicular to the direction of microwave propogation, the tube being open and accessible at both ends and composed of a dielectric material having a low water absorbing capacity and contributing to the homogeneity of an electric field in the resonator center;

a sample container including a sample chamber for holding the sample to be measured and configured to be insertable into the protective tube through one end thereof, the sample chamber having a diameter of not more than 25% of the diameter of the resonator cavity and a height of not more than 50% of the height of the resonator cavity;

a frequency modulated microwave oscillator for supplying microwave energy to the resonator; and

detector means for receiving microwave energy transmitted from the resonator to effect measuring of the water content of a sample in the resonator.

4,203,068

VIBRATING COIL ASSEMBLY

Matthäus Ebensberger; Jürgen Hesse, and Lothar Raab, all of Berlin, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Nov. 13, 1978, Ser. No. 959,569

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1977, 2753251

Int. Cl.[2] G01R *13/38, 1/02*

U.S. Cl. 324—97 **2 Claims**

1. In a vibrating coil assembly for mirror galvanometers, light-beam oscillographs and the like having a moving coil and a mirror wherein the coil is suspended between suspension elements formed of two tension wires or ribbons the improvement comprising:

the suspension elements having eyes at their ends nearest to the moving coil;

the moving coil being provided with a central window opening; and

a mounting wire passing in a continuous loop successively through the eye of a first suspension element, through the

coil window in a first direction from a first side of the coil to a second side of the coil, through the eye of a second suspension element, and through the coil window in a second direction from the second side of the coil to the first side of the coil to form a figure **8** with the moving coil clamped therein.

4,203,069

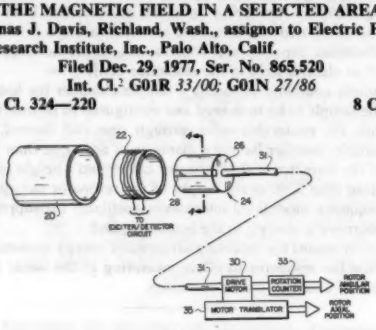
METHOD AND APPARATUS FOR NON-DESTRUCTIVELY TESTING ELECTRICALLY CONDUCTIVE ELONGATE CYLINDRICAL COMPONENTS USING AN EDDY CURRENT PRODUCING COIL WITH A ROTOR TO CONCENTRATE THE MAGNETIC FIELD IN A SELECTED AREA

Thomas J. Davis, Richland, Wash., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Dec. 29, 1977, Ser. No. 865,520

Int. Cl.[2] **G01R** *33/00;* **G01N** *27/86*

U.S. Cl. 324—220 **8 Claims**



1. Apparatus for non-destructively testing electrically conductive elongate cylindrical components with eddy currents, comprising:

(a) an eddy current inducing coil for generating a magnetic field which induces eddy currents in the cylindrical component being tested, said coil being generally cylindrical, hollow, and sized for insertion into the component;

(b) an independently rotatable rotor located inside of and coaxial with the inducing coil, said rotor includes a first member having high electrical conductivity for dissipating in selected areas the magnetic field energy generated by the coil and a second member having high magnetic permeability and located adjacent to the coil for enhancing the magnetic field coupling between the coil and the component being tested, thereby permitting eddy currents to be induced in a selected volume of the component, said first and second members have a generally integral cylindrical shape, said first and second members shape the magnetic field generated by the coil and concentrate the induced eddy currents into a predetermined inspection volume of the component; and

(c) means for rotating the rotor with respect to the component being tested in a predetermined manner so that the component is non-destructively tested by scanning with concentrated eddy currents.

4,203,070

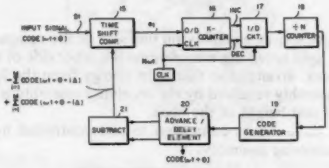
PSEUDO-RANDOM-NUMBER CODE DETECTION AND TRACKING SYSTEM

William M. Bowles, Arlington, and Duncan B. Cox, Jr., Beverly, both of Mass., assignors to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Aug. 8, 1978, Ser. No. 931,420

Int. Cl.[2] **H04K** *1/04;* **H04L** *25/10, 27/06*

U.S. Cl. 375—1 **13 Claims**



1. A pseudo-random-number code detection and tracking system comprising

means for receiving a transmitted coded signal;

means for generating a local coded feedback signal;

detector means having non-linear response characteristics responsive to said coded received signal and to said local coded signal and including means for comparing said received and local signals to produce an error signal when said received and local signals are not aligned;

means responsive to said error signal for controlling the operation of said local coded feedback signal generating means to vary the characteristics of said local coded feedback signal so as to cause said signals to become aligned and, thereby, to minimize said error signal;

control means, responsive to the statistical characteristics of said error signal, capable of dynamically changing the non-linear response characteristics of said detector means to said local coded signal and to said received coded signal so that said signals remain substantially aligned over a controllable range of error signal levels.

4,203,071

PSEUDO-RANDOM-NUMBER-CODE-DETECTION AND TRACKING SYSTEM

William M. Bowles, Arlington; Duncan B. Cox, Jr., Beverly, and Walter J. Guinon, Newburyport, all of Mass., assignors to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Aug. 8, 1978, Ser. No. 931,370

Int. Cl.[2] **H04K** *1/04;* **H03K** *6/04*

U.S. Cl. 375—1 **14 Claims**

7. A pseudo-random-number code detection and tracking system comprising

means for receiving a transmitted coded signal;

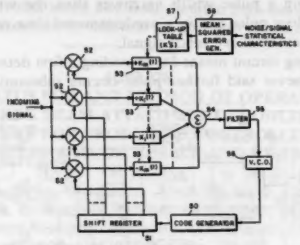
means for generating a local coded feedback signal;

detector means having non-linear response characteristics responsive to said coded received signal and to said local coded signal, said detector means including

shift register means for time shifting said coded feedback signal to provide a first plurality of time-shifted coded feedback signal components advanced in time and a sec-

ond plurality of timeshifted coded feedback signal components delayed in time;

means responsive to said first and second plurality of timeshifted signals components for providing dynamically selective attenuations thereof; and



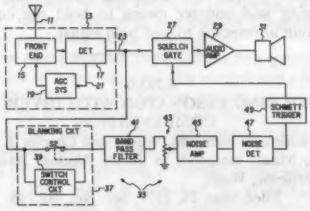
means for combining said selectively attenuated time-shifted signal components to produce said time-shifted coded feedback signals.

4,203,072

REDUCTION OF IMPULSE NOISE CONTRIBUTION TO RECEIVER SQUELCH THRESHOLD

Harley W. Beningfield, Satellite Beach, and Ward L. Sparks, Indian Harbour Beach, both of Fla., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed May 15, 1978, Ser. No. 905,668
Int. Cl.[2] H04B *1/10*
U.S. Cl. 455—223 **9 Claims**



6. For use with a receiver including demodulator means and demodulator means output intelligence processing means having gating means, squelch means comprising:

first means, connected to said demodulator means, for developing a control signal which is dependent on at least some noise energy in the demodulator means and which is for controlling said gating means; and second means, connected to said demodulator means and responsive to the amplitude of noise therein, for preventing noise energy from contributing to the development of said control signal during controlled intervals each extending at least for the time where the noise amplitude exceeds a predetermined level.

4,203,073

RADIO RECEIVER BLANKER GATE

James W. Rae, Schaumburg, and Larry R. Wright, Glenview, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 670,500, Mar. 25, 1976, abandoned. This application Feb. 6, 1978, Ser. No. 875,977
Int. Cl.[2] H04B *1/10*
U.S. Cl. 455—311 **22 Claims**

1. A radio receiver comprising:

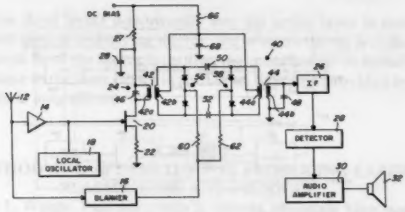
an antenna for receiving transmitted ratio frequency signals;

a radio frequency amplifier for amplifying the received signals;

a mixer for translating the received signals to an intermediate frequency;

a blanker for generating blanking signals in response to noise in the received signal;

a blanker gate for processing the intermediate frequency signals and, in response to a blanking signal from the blanker, blanking the intermediate frequency signals, the blanker gate having first and second matched transformers, each transformer having a primary and a secondary winding, the transformers interconnected to form a balanced, doubly tuned network adapted for receiving and tuning to the mixer at its input and tuning to a load at its output, the blanker gate further comprising two diode



pairs, each diode pair series connected, with first diode pair being connected in shunt with the first transformer secondary winding and the second pair being connected in shunt with the second transformer primary winding, each diode pair adapted to be activated to a conducting state in response to a blanking signal, said blanker gate including means for coupling, in the absence of said blanking signal, intermediate frequency signals from said first transformer secondary winding to said second transformer primary winding with a minimal disturbance effect;

an intermediate frequency stage for processing the signals at the output of the blanker gate;

a detector stage, coupled to the intermediate frequency stage, for recovering the baseband signal; and

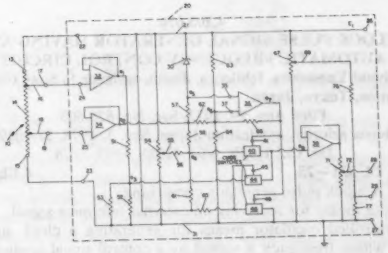
a means for transducing the baseband signal to audibility.

4,203,074

POTENTIOMETER CIRCUIT

Ernst Gass, Stuttgart, Fed. Rep. of Germany, assignor to Waters Manufacturing, Inc., Wayland, Mass.

Filed Feb. 22, 1977, Ser. No. 770,428
Int. Cl.[2] H03K *3/00*; G01P *3/42*
U.S. Cl. 308—181 **12 Claims**



1. A circuit providing a continuous sawtooth ramp voltage output of uniform slope from two displaced sawtooth voltage inputs of uniform slope, said circuit comprising

circuit means for bringing said sawtooth voltage inputs of uniform slope into an overlapped condition;

comparator means responsive to at least one of said voltage inputs providing a comparator output signal and

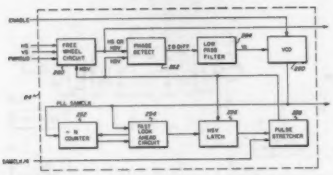
switch means responsive to said comparator output signal alternately switching said voltage inputs, as modified by said circuit means, onto a single line to provide said continuous sawtooth voltage output.

4,203,075

PHASE LOCKED LOOP CIRCUIT FOR VIDEO HARD COPY CONTROLLER

Louis E. Wessler, Cupertino, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 17, 1977, Ser. No. 843,012
Int. Cl.[2] H03B *3/04*
U.S. Cl. 331—1 A **12 Claims**



1. A phase-locked loop circuit comprising:

a voltage controlled oscillator responsive to a control voltage for generating a periodic output signal comprised of pulses occurring at a first frequency determined by the value of said control voltage;

first means responsive to said output signal for generating a periodic feedback signal comprised of pulses occurring at a second frequency which bears a predetermined relationship toward said first frequency;

second means, responsive to said feedback signal and to a first input signal having a first periodic interval during which pulses at a third frequency occur and a second periodic interval during which said pulses at said third frequency do not occur, for generating an output signal comprised of the pulses of said first input signal during the first periodic interval of said first input signal and the pulses of said feedback signal during the second periodic interval of said first input signal; and

third means responsive to the feedback signal from said first means and the output signal from said second means for generating said control voltage having a value dependent upon the phase differential between said feedback signal and the output signal from said second means.

4,203,076

CLOCK PULSE SIGNAL GENERATOR HAVING AN AUTOMATIC FREQUENCY CONTROL CIRCUIT

Noriyuki Yamashita, Ichikawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Aug. 29, 1977, Ser. No. 828,605
Claims priority, application Japan, Sep. 3, 1976, 51-105977
Int. Cl.[2] H03B *3/04*; H04N *5/05, 5/78*
U.S. Cl. 331—25 **4 Claims**

1. A clock pulse generator comprising:

input means for receiving an external reference signal;

controlled oscillator means for generating a clock signal whose frequency is varied by a control signal applied to said oscillator means;

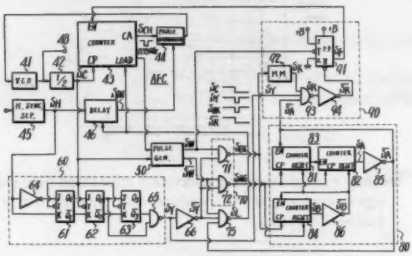
counter means for frequency-dividing said clock signal to obtain a comparing signal having substantially the same frequency as said external reference signal;

phase comparator means for comparing the phase of said comparing signal with the phase of said external reference signal and providing said control signal in correspondence to a detected phase difference therebetween;

first signal forming means for forming a window pulse between a first count and a second count of said counter means;

second signal forming means for generating a further pulse having a pulse width narrower than the width of said window pulse and in a predetermined time relation with said external reference signal;

detecting circuit means for providing a first detecting signal whenever said further pulse occurs substantially during



said window pulse, and a second detecting signal whenever said further pulse occurs substantially at a time other than during said window pulse; and

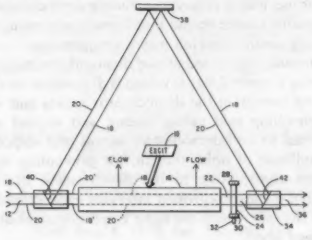
means responsive to said first and second detecting signals for selectively inhibiting said control signal when said further pulse does not occur substantially during said window pulse, including means for generating a hold signal in response to a succession of a predetermined number of said first detecting signals; and, means for causing said counter means to hold the count stored therein in response to said hold signal.

4,203,077

LASER RING RESONATOR WITH DIVERGENCE COMPENSATION

Keimpe Andringa, Richland, Wash., and Charles T. Pike, Lexington, Mass., assignors to Jersey Nuclear Avco Isotopes, Inc., Bellevue, Wash.

Filed Mar. 28, 1977, Ser. No. 781,799
Int. Cl.[2] H01S *3/083*
U.S. Cl. 331—94.5 C **15 Claims**



1. A ring laser comprising:

a laser medium having there through a laser medium path for radiation to traverse said medium;

means for exciting said medium to a lasing condition;

an input beam path for laser radiation;

reflecting means along said laser medium path, for providing reflections in said laser beam path to reapply laser radiation along said laser medium path to said laser medium after an odd number of reflections in a configuration to invert the reapplied radiation from side to opposite side,

said reflecting means including polarizer crystal means including at least one window for injecting laser radiation from said input beam path, into said medium for amplification thereby; and at least one window for transmitting a portion of the radiation from said laser medium to an output beam path;

means provided along said laser medium path for changing the polarization in radiation on said laser medium path.

4,203,078

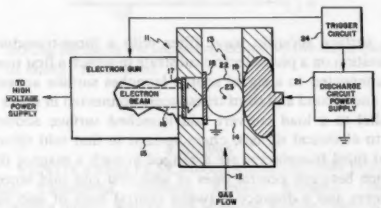
APPARATUS FOR AND METHOD OF OPERATING ELECTRON BEAM ATTACHMENT STABILIZED DEVICES FOR PRODUCING CONTROLLED DISCHARGES AND/OR VISIBLE AND UV LASER OUTPUT

Jack D. Daugherty, Winchester; Jonah H. Jacob, Cambridge, and Joseph A. Mangano, Belmont, all of Mass., assignors to Avco Everett Research Laboratory, Inc., Everett, Mass.

Filed May 6, 1977, Ser. No. 794,401

Int. Cl.[2] H01S *3/097*

U.S. Cl. 331—94.5 PE **29 Claims**



1. In laser apparatus having means for producing a substantially spatially uniform discharge in a gaseous lasing medium, said discharge producing means comprising:

(a) a gaseous lasing medium comprising a first gaseous species capable of being electronically excited and a halogen bearing molecular second gaseous species;

(b) a cavity for receiving said lasing medium;

(c) first means for ionizing said lasing medium in said cavity and generating free electrons; and

(d) second means for applying a voltage across said lasing medium to heat said free electrons to an energy level necessary to produce an excited metastable state in said first species and excite a portion of said first species to the metastable state whereby said excited first species reacts with said second species to form an excited composite comprising said excited first species and said second species, said first and second means providing an equilibrium ionization rate in said lasing medium; said second species being present in an amount to provide an electron attachment rate at least about n times the said equilibrium ionization rate where n is the number of electron excitations which causes ionization of said first gaseous species.

4,203,079

INJECTION LASERS

George H. B. Thompson, Sawbridgeworth, and David F. Lovelace, Waltham Abbey, both of England, assignors to ITT Industries, Inc., New York, N.Y.

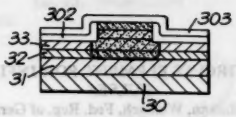
Filed Mar. 13, 1978, Ser. No. 886,235

Claims priority, application United Kingdom, Apr. 1, 1977, 13972/77

Int. Cl.[2] H01S *3/19*

U.S. Cl. 331—94.5 H **10 Claims**

1. In a double heterostructure injection laser comprising an active region formed in an active layer of lower band-gap material, which layer is sandwiched between upper and lower layers of higher band-gap material, all three layers having the same conductivity type, wherein overlying said active layer is a surface of the laser provided with a rib of material doped with a mobile dopant providing said rib with the opposite conductivity type to that of the three layers, which rib extends in the direction of the optical axis of the laser cavity from one end face thereof to the other, wherein said dopant has been caused to translate the p-n junction that lies between the rib



and the three layers downwardly into the active layer in that portion thereof underlying the rib, and wherein the rib is so far removed from the active layer that the contribution to optical guidance in the laser cavity in the lateral direction provided by the rib is insignificant.

4,203,080

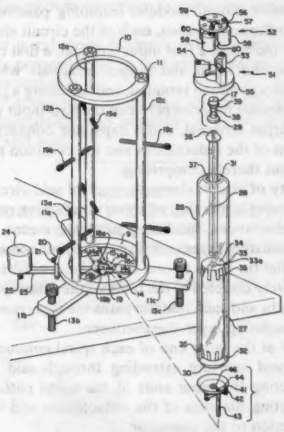
METHOD AND APPARATUS FOR PRODUCING LASER PLASMA TUBE AND PRODUCT

Dave L. Wright, Palo Alto; Felix J. Schuda, Mountain View, and Joseph J. Spranza, III, Woodside, all of Calif., assignors to Spectra Physics, Inc., Mountain View, Calif.

Continuation of Ser. No. 689,039, May 24, 1976, abandoned. This application Jun. 14, 1978, Ser. No. 915,461

Int. Cl.[2] H01S *3/02*

U.S. Cl. 331—94.5 D **12 Claims**



1. A bakable laser plasma tube assembly comprising in combination:

an elongate glass envelope having a cathode end and an anode end with an axis defined therebetween,

a capillary tube in abutment with said anode end of said glass envelope and supported within said envelope along said axis, an electron emissive cathode supported within said envelope at said cathode end in alignment with said axis,

a cathode end assembly including a metal disc in abutment with said cathode end of said glass envelope and electrically and supportably contacting said cathode, a first optical element, means for mounting said first optical element on said disc along said axis and being angularly deformable with respect to said axis, and

an anode end assembly in abutment with said anode end of said glass envelope and including an anode and a second

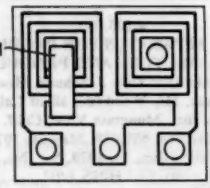
optical element mounted thereon along said axis, said anode being deformable for angular adjustment of said second optical element along said axis.

4,203,081

PASSIVE CIRCUIT ELEMENT FOR INFLUENCING PULSES

Walter Braeckelmann, Weidach, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Mar. 17, 1978, Ser. No. 887,652
Claims priority, application Fed. Rep. of Germany, Mar. 31, 1977, 2714426
Int. Cl.[2] H03H *7/04, 7/18, 7/30*
U.S. Cl. 333—138 **3 Claims**



1. A passive circuit module, including passive circuit elements for influencing pulses, each of the circuit elements being of the type including a first input terminal, a first output terminal, and second input and output terminals which may be combined as a common terminal, and including a pair of inductances connected in series between the first input terminal and the first output terminal, and a capacitor connected between the junction of the inductances and the common terminal, the improvement therein comprising:

a plurality of circuit elements, each of said circuit elements comprising a plurality of spiral conductive paths forming the inductances, insulating substrate means including a first insulating layer carrying said spiral conductive paths such that the turns of one said spiral conductive paths are oppositely directed to the turns of the other spiral conductive paths and such that the paths are superposed with said first insulating layer therebetween;

a contact at the inner end of each spiral conductive path;

a metallized aperture extending through said contact for connecting the inner ends of the spiral paths to form a connecting junction of the inductances and to receive a connection to the capacitor;

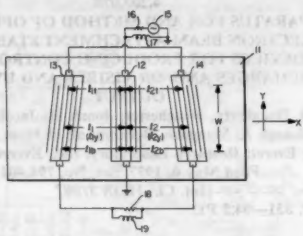
said capacitance comprising first and second capacitors connected in parallel and including a second insulating layer and first and second conductive plate layers carried on opposite sides of said second insulating layer, a third insulating layer and third and fourth conductive plate layers carried on opposite sides of said third insulating layer, a fourth insulating layer separating said first conductive plate layer from one of said spiral conductive paths, a fifth insulating layer separating said third conductive plate layer from the other of said spiral conductive paths, said metallized aperture extending through said fourth and fifth conductive layers to connect said contacts of said inner ends of said spiral conductive paths to said first and third conductive plate layers, and an additional metallized aperture electrically connecting said second and fourth conductive plate layers.

4,203,082

SURFACE ACOUSTIC WAVE FILTER

Masahide Tsukamoto, Neyagawa; Masahiro Nagasawa, Hirakata, and Hiroshi Yamazoe, Katano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 31, 1978, Ser. No. 911,082
Claims priority, application Japan, Jun. 3, 1977, 52/66141
Int. Cl.[2] H03H *9/04, 9/26, 9/32;* **H01L** *41/10*
U.S. Cl. 333—194 **27 Claims**



1. A surface acoustic wave filter with a three-transducer configuration on a piezoelectric substrate in which a first transducer connected to a signal source launches surface acoustic waves, and second and third transducers connected in series or in parallel to a load convert said launched surface acoustic waves to electrical signals, characterized in that said second and said third transducers are arranged in such a manner that a distance between central lines of said first and said second transducers and a distance between central lines of said first and said third transducers vary linearly along a Y-direction which is perpendicular to an X-direction which is parallel to the direction of said surface acoustic waves, with the proviso that $|l_{1t}-l_{1b}|=|l_{2t}-l_{2b}|=\alpha\lambda_0$, where l_{1t} and l_{1b} are distances between the center lines of the first and the second transducers at the top part and the bottom part of the first and second transducers, respectively, l_{2t} and l_{2b} are distances between the center lines of the first and the third transducers at the top part and the bottom part of the first and the third transducers, respectively, α is a coefficient between 0.15 and 0.45, and λ_0 is a wavelength of a surface acoustic wave at a center frequency at which said first transducer has a maximum response.

4,203,083

OPERATING MECHANISM FOR A CIRCUIT INTERRUPTING DEVICE

John C. Opfer, Deerfield, and Karel E. Vojta, Chicago, both of Ill., assignors to S & C Electric Company, Chicago, Ill.

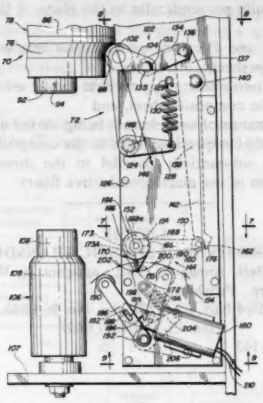
Filed Aug. 3, 1978, Ser. No. 930,774
Int. Cl.[2] H01H *9/00, 3/00*
U.S. Cl. 335—174 **28 Claims**

1. Apparatus for operating a circuit interrupting device by selectively latching and releasing a large quantum of stored mechanical energy; the device being of the type which includes a pair of relatively movable contacts which are engaged when the large quantum of energy is stored, release of the large quantum of energy separating the contacts in an interrupting medium to interrupt the circuit, wherein the apparatus comprises:

high mechanical advantage lever-link means for normally latching the large quantum of stored mechanical energy by and during the application to the lever-link means of a low latching force;

movable means for storing latching-force-removing mechanical energy during movement in a first direction in response to a first condition, and for moving in a second direction solely by the stored latching-force-removing energy in response to a second condition which follows the first condition; and

ratchet means for removing the low latching force from the lever-link means in response to movement of the movable



storing means in the second direction so the large quantum of energy is released.

4,203,084

VENTILATED ELECTROMAGNETIC SWITCH

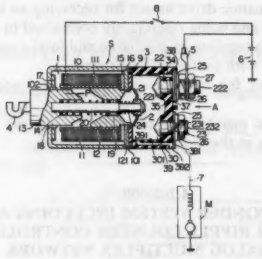
Takao Yamaguchi, Nagoya; Kenjiro Aoyama, Okazaki; Yukihiro Nishio, Kariya, and Sadayosi Kazino, Nagoya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed May 8, 1978, Ser. No. 903,614

Claims priority, application Japan, May 13, 1977, 52-62037[U]

Int. Cl.[2] H01H *45/12, 9/02*

U.S. Cl. 335—202 **6 Claims**



1. A ventilated electromagnetic switch comprising:

an electromagnet casing;

a coil mounted in said casing;

a stationary magnetic core mounted to be magnetized by said coil;

a movable magnetic core mounted to be attracted to said stationary magnetic core;

a switch cover mounted to said electromagnetic casing to define a contact chamber therein; and

a contact member arranged in said contact chamber and mounted to be actuated and deactuated by the movement of said movable magnetic core;

said switch cover being provided with at least two meander paths formed therein to independently communicate the inside of said contact chamber with the surrounding atmosphere.

4,203,085

INDUCTION COIL CORE

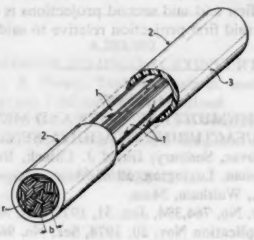
Walter Elsässer, Burgberg, and Werner Hofmann, Sonthofen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 4, 1978, Ser. No. 948,429

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1977, 2745990

Int. Cl.[2] H01F *27/24*

U.S. Cl. 336—210 **9 Claims**



1. Induction coil core comprising a plurality of elongated essentially flat metal strips (1) of magnetic material clustered to form a unit having a cross section with a substantially circular circumference having a radius of a first predetermined length (r) extending from an axis;

wherein each of said metal strips has an end edge extending in said cross section and having an end edge length substantially less than said predetermined length;

wherein said end edges of said plurality of metal strips are arranged in random directions in said cross section of said unit;

each of said metal strips having a pair of elongated edges essentially perpendicular to said end edges and essentially parallel to said axis;

and further comprising combining means (2) for permanently maintaining said plurality of metal strips in the shape of said unit.

4,203,086

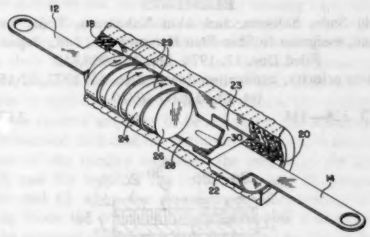
TEMPERATURE-SENSITIVE SPIRAL SPRING SLIDING CONTACT DEVICE

Dennis D. Smith, Carol Stream, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Oct. 2, 1978, Ser. No. 947,674

Int. Cl.[2] H01H *37/76*

U.S. Cl. 337—410 **9 Claims**



1. A thermally-sensitive switch comprising an elongated cylindrical housing, first and second leads extending from opposite ends of said housing, a first electrically-conductive projection connected to said first lead, an elongated cylindrical thermally-fusible pellet in said cylindrical housing, an elongated, spiral, electrically-conductive spring in electrical

contact with said second lead, and having a plurality of turns which completely encircle said pellet in a spiral path that extends in a direction from said second lead toward said first lead, said spiral spring having a normal inner diameter which is less than the outer diameter of said thermally-fusible pellet, said spiral spring being expanded and held in a stressed expanded diameter state on said thermally-fusible pellet so that a second electrically-conductive projection connected to said spiral spring extends toward said first projection such that when said thermally-fusible pellet melts said spiral spring relaxes to its normal unexpanded diameter and the contact state between said first and said second projections is changed due to rotation of said first projection relative to said second projection.

4,203,087

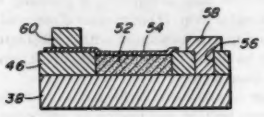
ABSOLUTE HUMIDITY SENSORS AND METHODS OF MANUFACTURING HUMIDITY SENSORS

Michael G. Kovac, Sudbury; David J. Chleck, Brookline, and Philip Goodman, Lexington, all of Mass., assignors to Panametrics, Inc., Waltham, Mass.

Division of Ser. No. 764,394, Jan. 31, 1977, Pat. No. 4,143,177. This application Nov. 20, 1978, Ser. No. 962,056

Int. Cl.[2] G01R *27/02*

U.S. Cl. 338—35 **5 Claims**



1. The method of manufacturing a humidity sensor comprising the steps of

(a) providing an Si substrate having a microscopically smooth surface,

(b) forming a layer of non-porous SiO_2 on a first region of said Si surface surrounding a second region,

(c) forming an oxide of the Si in said second region to provide a layer of porous SiO_2,

(d) building up an electrically conductive layer, which is substantially permeable to water vapor, over at least a major portion of the exposed surface of said porous SiO_2, and

(e) establishing electrical contact with the layer produced in step (d) and with the Si substrate beneath said porous SiO_2 layer.

4,203,088

PRESSURE-SENSITIVE MULTIPLE RESISTOR ELEMENTS

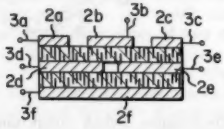
Ryoichi Sado, Saitama, and Akio Nakamura, Toda, both of Japan, assignors to Shin-Etsu Polymer Co., Ltd., Japan

Filed Dec. 12, 1978, Ser. No. 968,810

Claims priority, application Japan, Dec. 15, 1977, 52-151143

Int. Cl.[2] H01C *10/10*

U.S. Cl. 338—114 **2 Claims**



1. A pressure sensitive multiple resistor element responsive to an external compressive force comprising

(a) an anisotropically electroconductive composite sheet formed of an electrically insulating rubbery elastomer as a matrix within which a number of electroconductive fibers are dispersed and oriented in alignment in the direction substantially perpendicular to the plane of the composite sheet.

(b) at least one electrode provided on one surface of the composite sheet,

(c) at least two electrodes provided on the other plane surface of the composite sheet, and

(d) the resistance of said element being varied upon application of said compressive force to the composite sheet in a direction substantially parallel to the direction of the orientation of the electroconductive fibers.

4,203,089

ELECTRO-HYDROACOUSTIC TRANSDUCER

David A. DeBell, Annapolis, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 30, 1978, Ser. No. 965,015

Int. Cl.[2] H04B *13/00*

U.S. Cl. 367—143 **14 Claims**

1. A transducer for use in a water medium comprising:

(A) a fluid circuit including a supply pump, a return pump, valving means, and accumulator means connected between said supply and return pumps;

(B) a plenum chamber having an aperture open to the ambient water pressure;

(C) said valving means being positioned within said plenum chamber and including a discharge port for discharging the fluid from said supply pump into said plenum chamber, and an intake port for returning fluid from said plenum chamber back to said return pump;

(D) electrodynamic drive means for receiving an input electrical signal and being operatively connected to said valving means to regulate its discharge and intake operation in accordance with said electrical signal;

(E) a container for housing said pumps and accumulator means; and

(F) means for maintaining the interior of said container substantially at the ambient water pressure.

4,203,090

TRANSPONDER SYSTEM INCLUDING AN OSCILLATOR RIPPLE COUNTER CONTROLLING A CODED ANALOG MULTIPLEX NETWORK IN A CIRCUIT WITH A DRIVER/GATE CIRCUIT FOR GENERATING RED-ALERT END CONDITION DIGITAL SIGNALS IN A STORAGE TANK GAUGING SYSTEM

John S. Adamson, Pleasant Hill, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Nov. 25, 1977, Ser. No. 855,033

Int. Cl.[2] G08C *19/16*; H04Q *9/14*

U.S. Cl. 340—152 T **17 Claims**

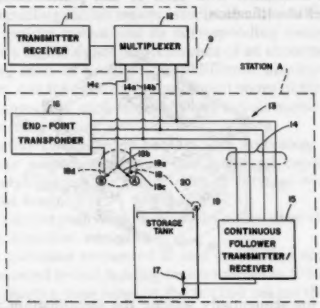
1. Transponder network for generating a "red-alert" digital code upon (i) occurrence of an overflow condition within a storage tank under survey and (ii) receipt of a square wave interrogation signal from a transmitter/receiver of a tank gauging systems located at a central station remote from said storage tank but electrically connected to said transponder network through an INTERROGATION, a MARK and a SPACE line of said tank gauging system, comprising:

(A) I/O network for receiving said interrogation signal including voltage divider means for generating a microcir-

cuit drive voltage for a period concident with the pulse width of said interrogation signal;

(B) an oscillator/ripple counter formed essentially of MSI's connected to said I/O network and including at an input, a power-on-reset network for generating a reset pulse for said oscillator/ripple counter, said oscillator/ripple counter generating, in response to said reset pulse, sets of square wave pulses of differing repetition rates and pulse widths;

(C) multiplexer means and gate means connected to each other and to (B) responding to selected sets of said square



wave pulses to generate a synthetic digital code at micro-circuit signal levels at an output means of said gate means;

(D) drive means including switching transistor means having one or more inputs connected to said gate means of (C), and one or more output means connected to said MARK and SPACE lines through said I/O of (A), said drive means being controllable as a function of said synthetic digital code to drive said MARK and SPACE lines between tank gauging operating potentials for generating said "red-alert" digital code of interest at said central station whereby said overflow condition within said storage tank can be indicated.

4,203,091

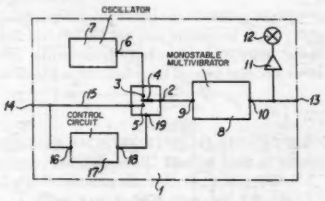
SEQUENTIALLY ACTUATED FLASHING LIGHT APPARATUS

Hans G. Kruskopf, Åkersberga, Sweden, assignor to Mats Holersson Fridmark, Alvsjo, Sweden

Filed Feb. 22, 1978, Ser. No. 880,271

Int. Cl.[2] G03B 5/38; H05B 39/09

U.S. Cl. 340—331 **8 Claims**



1. A flashing light apparatus including a plurality of flashing light units forming a chain of light units in which each light unit produces a flash of light in a predetermined time slot different from the time slot associated with adjacent light units in the chain, wherein each light unit comprises:

an input terminal for receiving control signals from a preceding light unit in the chain of light units;

an oscillator for producing pulses at a predetermined rate;

a multivibrator circuit for producing output signals;

switching means for selectively connecting said multivibrator to receive pulses from said oscillator in a first mode and control signals from said input terminal in a second mode;

control circuit means responsive to the signals at said input terminal for controlling the operation of said switching means;

flashing means responsive to an output signal from said multivibrator to produce a flash of light; and

an output terminal adapted to provide output signals from said multivibrator circuit as control signals to a subsequent light unit in the chain.

4,203,092

ANALOGUE-TO-DIGITAL CONVERTER

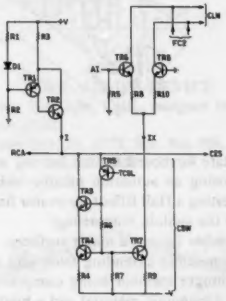
Christopher C. A. Priest, Taplow, England, assignor to The Plessey Company Limited, Illford, England

Filed Sep. 20, 1978, Ser. No. 944,020

Claims priority, application United Kingdom, Oct. 1, 1977, 40859/77

Int. Cl.[2] H03K 13/02

U.S. Cl. 340—347 AD **4 Claims**



1. A p.c.m. encoder/decoder arrangement comprising at least one transmit amplifier, at least one receive amplifier, a comparator, an analogue-to-digital converter of the ladder network type, a constant current generator and means for switching the constant current generator to drive the transmit amplifier or the receive amplifier, said means for switching the constant current generator to the input or output amplifiers comprising a current steering switch provided for each transmit and receive amplifier, wherein each current steering switch comprises a first transistor which is activated by a select signal which causes current to flow through the emitter and collector and collector load resistors of said first transistor to a negative potential rail, said first transistor causing a second and third transistor to conduct current to the negative potential rail via an emitter load resistor, said second and third transistors having their respective collector and emitter connected in series and a fourth transistor which is activated when said third transistor is activated which thereby causes the respective transmit or receive amplifier to be activated, the arrangement being connected such that the output of the transmit amplifier, the input of the receive amplifier, the output of the ladder network and the input of the comparator are all connected together and (i) when the arrangement is operating in the encoding mode the constant current generator is switched to drive the transmit amplifier which is also fed by the analogue sample to be transmitted and the current produced by the transmit amplifier is applied to the comparator and the comparator is arranged to detect a null current when the current produced by the ladder network is equal to that produced by the transmit amplifier and (ii) when operating in the decoding mode the ladder network produces an analogue sample in accordance with a digital sample to be decoded and the constant current generator is switched to drive the receive ampli-

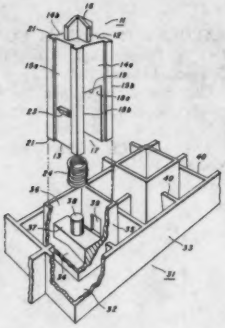
fier to produce an output analogue sample indicative of the signal decoded.

4,203,093

SOLID STATE KEYSWITCH ARRANGEMENT

Jon L. Edwards, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 19, 1978, Ser. No. 943,823
Int. Cl.[2] H03K *17/90*; H01L *43/06*
U.S. Cl. 340—365 L **17 Claims**



1. A solid state keyboard switch having at least one key member comprising an actuation member with an actuation surface for actuating a Hall Effect generator fixedly positioned with respect to the switch, comprising:

(a) a base member having a major surface;

(b) a plunger member extending from said actuation member, said plunger member being comprised of a uniform mixture of a magnetic material and a binder, a portion of said plunger member being charged to a preselected magnetic field, said plunger member being moveable relative to said major surface in response to manual pressure on said actuation surface;

(c) a spring member for normally biasing said plunger member away from said major surface thereby forcing said plunger member to return to a non-activated position upon release of manual pressure from said actuation surface; and

(d) at least one Hall Effect generator being responsive to the relative position of said plunger member for generating an electrical signal in accordance therewith.

4,203,094

APPARATUS FOR SELECTIVELY DISPLAYING A PLURALITY OF INDICATION PANELS

Kunihiro Sowa, Okazaki, and Motoharu Esaki, Oobu, both of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Sep. 7, 1977, Ser. No. 831,291
Claims priority, application Japan, Sep. 21, 1976, 51-126935[U]
Int. Cl.[2] G08B *21/00*; B60Q *11/00*
U.S. Cl. 340—378.5 **3 Claims**

1. An apparatus for selectively displaying a plurality of indication panels, comprising:

a pair of spaced side walls;

first and second rotatable assemblies positioned in spaced parallel relationship and rotatably supported by said side walls;

means for detachably interconnecting said indication panels in an endless belt supported by said rotatable assemblies;

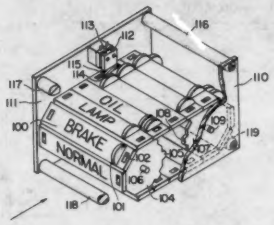
an electric motor coupled to said first rotatable assembly for rotating said first assembly to thereby move the endless belt with respect to the first and second rotatable assemblies; and

motor control means connected to said electric motor for controlling the rotation of said motor, said control means including:

a plurality of input terminals corresponding in number to the number of indication panels;

converter means connected to said input terminals and responsive to a signal on at least one of said terminals to produce a binary coded output representative of the input terminal to which said signal is applied;

means associated with each of said panels for providing panel identification;



means for sequentially sensing the identification means of each panel during movement of the endless belt and developing binary coded signals in response to the sensing;

means for comparing said binary coded output with the binary coded signals developed by said sensing means to produce a motor controlling output from said comparing means, and

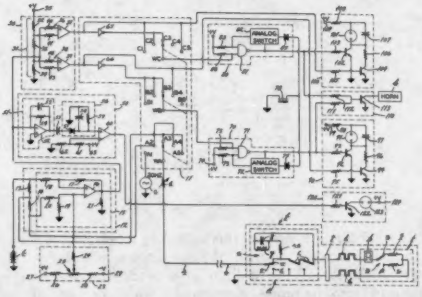
means for connecting the motor controlling output to said electric motor whereby when there is coincidence between a binary coded output and a binary coded signal, said motor is stopped permitting an indication panel to be displayed.

4,203,095

MONITORING APPARATUS FOR DIRECT WIRE ALARM SYSTEM

Stanley Wilson, Jr., St. Charles, Mo., assignor to Potter Electric Signal Co., St. Louis, Mo.

Continuation-in-part of Ser. No. 722,409, Sep. 13, 1976, abandoned. This application Dec. 1, 1977, Ser. No. 856,278
Int. Cl.[2] G08B *29/00*
U.S. Cl. 340—506 **4 Claims**



1. For use with a security protection system of the type having a fixed voltage power source supplying supervisory current via a communications line to protected premises at which protective devices serve to produce changes from the normal supervisory current level to a plurality of abnormal supervisory current levels,

monitoring apparatus including

A. means to produce a digital signal at an output on occurrence of an abnormal current level in the communications line, said means having an output for each of the plurality of abnormal current levels,

B. a holding register means for each of said outputs, connected to receive the digital signal output and to indicate by a latched output that an abnormal supervisory current level has occured,

C. selector switch means to set the monitoring apparatus either for a normal current level condition or for a selected one of a plurality of abnormal current level conditions, and

D. a signalling circuit means associated with each said holding register means and its corresponding means to produce a digital signal on occurrence of an abnormal current level, each to produce three different displayed indications, one for each of three different states of the monitoring apparatus, each said signalling circuit means including

a neon lamp having a voltage of activation,

a capacitor connected in parallel with said lamp,

a power source coupled to said lamp and capacitor, and supplying a voltage greater than the voltage of activation of the lamp,

a first current path from said parallel connection of said lamp and capacitor, comprising

a first transistor connected to said connection and being so connected to said holding register means as to be rendered conductive responsive to the latched output thereof,

whereby when said first transistor is conductive, to charge said capacitor and light said lamp, together with

a second current path from said parallel connection, comprising

a second transistor so connected as to receive and be rendered conductive responsive to the digital signal output of said means to produce a digital signal to indicate an abnormal supervisory current level,

resistor means in series with said second transistor and being of such value as to limit the current to a value insufficient to light said lamp,

whereby, when only said second transistor is conductive, the capacitor charges slowly due to said resistor means and then discharges through the lamp to cause it to blink at a visually discernable rate,

whereby the said three displayed indications are:

(1) said lamp is off, when said means to produce a digital signal has an output corresponding to a normal supervisory current level when set by said selector switch means for the normal condition; or

(2) said lamp is lighted, when said holding register means has a latched output which is abnormal for the condition for which the apparatus is set by said selector switch means; or

(3) said lamp blinks, when said holding register means has a latched output for that abnormal supervisory current level corresponding to the abnormal condition for which the apparatus is set by said selector switch means.

4,203,096

SENSOR MONITORING ALARM SYSTEM

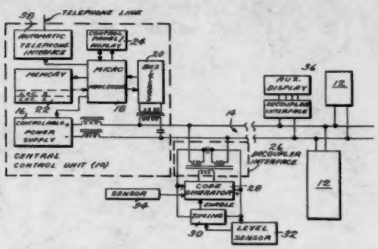
Max F. Farley, and Edmund L. Dutton, both of Marietta, Ohio, assignors to Mallinckrodt, Inc., St. Louis, Mo.

Filed Apr. 6, 1978, Ser. No. 896,364
Int. Cl.[2] G08B *25/00*
U.S. Cl. 340—538 **16 Claims**

1. A multiplex sensor monitor system of the type including a central control unit connected to a plurality of remote sensor units through a two-wire bus line wherein each remote sensor unit comprises:

means, responsive to a signal indicative of a sensed condition and control signals applied thereto, for controllably generating onto said two-wire bus line a dual tone multifrequency (DTMF) indicative of said sensed condition;

means, for coupling said remote unit to said bus line and for deriving power for said remote sensor unit solely from a DC signal applied thereto over said two-wire bus line without the use of any battery or other local power source; and



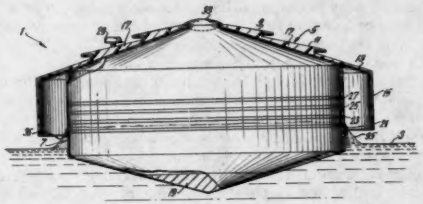
means, responsive to a reset signal applied thereto as an interruption of said D.C. signal, for generating a control signal to effect generation of said DTMF code signal after a respective predetermined time.

4,203,097

POOL ALARM DEVICE

John J. Manning, San Jose, Calif., assignor to RMR Systems, Inc., San Jose, Calif.

Filed Oct. 31, 1978, Ser. No. 956,379
Int. Cl.[2] G08B *21/00*
U.S. Cl. 340—566 **3 Claims**



1. An alarm for indicating a disturbance in an electrically conductive liquid medium, said alarm comprising:

a body capable of flotation in the liquid medium;

a first conductive member carried on a lower portion of said body and adapted to be normally immersed in the liquid medium;

a plurality of vertically and axially spaced second conductive members arranged about the periphery of said body and vertically and axially spaced from and normally out of electrical contact with said first conductive member and adapted to be normally out of contact with the liquid medium in the absence of a disturbance in the liquid medium;

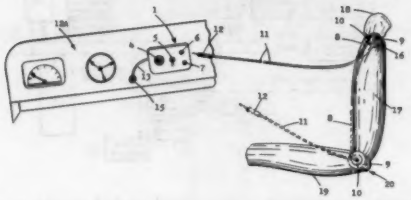
alarm means operatively electrically connected to said first conductive member and to a selected one of said second conductive members such that upon a disturbance of the liquid medium exceeding a minimum predetermined level, said first conductive member and said selected one of said second conductive members are brought into electrical connection through the liquid medium, thereby to activate said alarm means; and switch means for connecting said alarm means to said selected one of said second conductive members, thereby to select the minimum magnitude of a disturbance in the liquid medium required to electrically connect said first and second conductive members to actuate said alarm.

4,203,098

DEVICE FOR PREVENTING DOZING WHILE DRIVING A CAR

Hrand M. Muncheryan, 1735 N. Morningside St., Orange, Calif. 92667

Filed Sep. 18, 1978, Ser. No. 943,249
Int. Cl.[2] G08B 21/00
U.S. Cl. 340—575 **14 Claims**



1. A device for preventing dozing while driving a car, comprising: a first means having a housing adapted to be attached to the dashboard of an automobile and a second means adapted to be mounted on the upwardly projecting back of a driver's seat and having an integral extension therefrom for abutment with the driver's back when he is seated on said seat, said first means and said second means being in electrical connection theretogether by means of an electric conductor; said first means having therein an electrical circuit energizable from an electric current source therein, electric outlets disposed on the wall of the housing of said first means and connected to said electrical circuit, which is provided therein with branched circuit sections having a current-channeling means to permit selection of a current from said branched circuit sections, and a current-intensity control means in electrically series relation with said current-channeling means to adjust the intensity of current flow therethrough from either of said branched circuit sections to said electric outlets; one of said branched circuit sections having therein means to produce a recurrent flow of current therethrough and when in electrical contact with said current-channeling means a recurrent flow of current therethrough is transmitted to said second means though one of said electric outlets and said electric conductor, and when said current-channeling means is in electrical connection with the other of said branched circuit sections an uninterrupted flow of current passes therethrough to said second means through one of said electric outlets and said electric conductor; means disposed in said second means to receive a recurrent flow of current from one of said branched circuit sections and to produce in said second means pulsative undulations, the vibratory effect of which is transmitted through the integral extension of said second means to the back of a driver, seated in the driver's seat, for preventing him from dozing while driving; and, when said uninterrupted flow of current is transmitted to said second means through the circuit path abovedescribed it produces therein undulations which are variable in intensity by means of said current-intensity control means, the vibratory effect of said undulations being transmitted by the integral extension of said second means to the driver for producing relaxation in his body tired from driving, when he stops his car to rest.

4,203,099

SENSOR FOR SOFT DRINK DISPENSER

Raymond A. Edwards, New York, N.Y., assignor to Elser Farms Corporation, West Chester, Pa.

Filed Jun. 21, 1978, Ser. No. 917,509
Int. Cl.[2] G08B 19/00
U.S. Cl. 340—619 **8 Claims**

1. A sensor apparatus for indicating when a fluid holding tank within a soft drink dispensing machine and the like has been emptied, said tank including a light passing fluid discharge line, at least a portion of the inside wall thereof being a concaved surface, comprising:

photo monitoring means for detecting the presence of fluid in said discharge line;

means, responsive to said photo monitoring means, for providing a signal indicative of the absence of fluid in said discharge line and for initiating a departure of normal dispensing machine opeation as a function of said fluid absence; and

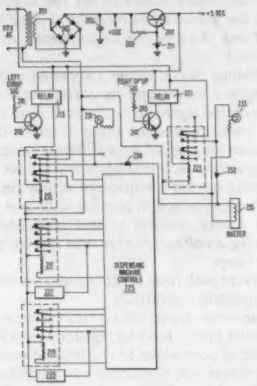


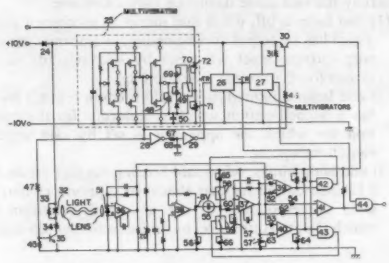
photo means for checking the integrity of said photo monitoring means, being optically coupled thereto.

4,203,100

LIGHT DECREASE TYPE SMOKE SENSOR

Yukio Yamauchi, Kawasaki, and Hiroshi Homma, Tokyo, both of Japan, assignors to Hochiki Corporation, Tokyo, Japan

Filed May 19, 1978, Ser. No. 907,466
Claims priority, application Japan, May 23, 1977, 52-58864
Int. Cl.[2] G08B 17/10
U.S. Cl. 340—630 **12 Claims**



1. A light-depreciation type smoke detector comprising:

a light emitter;

a light receiver;

a smoke detecting space between said light emitter and receiver;

an amplifier connected to said light receiver for amplifying the output of said receiver;

a differential amplifier circuit connected to said amplifier;

a comparator circuit connected to the output of said amplifier circuit;

a memory circuit connected to said comparator circuit and to said differential amplifier circuit, said memory circuit producing an output controlling the output of said differential amplifier which latter output is proportional to any

depreciation of the light received by said receiver from said emitter through such smoke detecting space; and

an alarm operating circuit connected to receive the output from said differential amplifier and the output from said memory circuit for producing a signal corresponding to the light depreciation ratio by dividing the output from said differential amplifier by the output from said memory circuit;

whereby contamination due to age and environment of said light emitter and receiver are minimized.

4,203,101

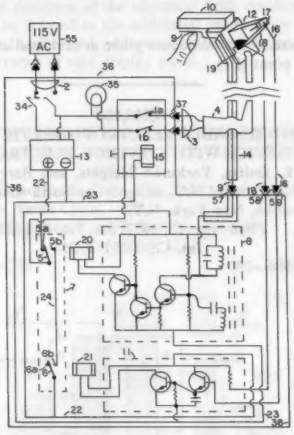
ELECTRIC POWER INTERRUPTING APPARATUS

Marvin S. Towsend, 1365 Potomac Heights Dr., Oxon Hill, Md. 20022

Continuation-in-part of Ser. No. 758,395, Jan. 11, 1977, abandoned. This application Feb. 28, 1979, Ser. No. 16,196

Int. Cl.[2] G08B *21/00*

U.S. Cl. 340—635 **13 Claims**



1. An AC power interrupting means for a hand-held appliance, comprising:

a. a DC power supply;

b. an AC power connecting means;

c. an electrically actuated switching circuit for controlling said AC power connecting means which is powered by said DC power supply and which is controlled by a first touch circuit controlled switching means and a first orientation circuit controlled switching means in said electrically actuated switching circuit;

d. a touch sensor and a touch circuit powered by said DC power supply for controlling said first touch circuit controlled switching means by means of a first electrically powered switch actuator in said touch circuit; and

e. an orientation sensor and orientation circuit powered by said DC power supply for controlling said first orientation circuit controlled switching means by means of a second electrically powered switch actuator in said orientation circuit.

4,203,102

CHARACTER DISPLAY SYSTEM

Alan F. Hydes, Southampton, England, assignor to International Business Machines Corporation, Armonk, N.Y.

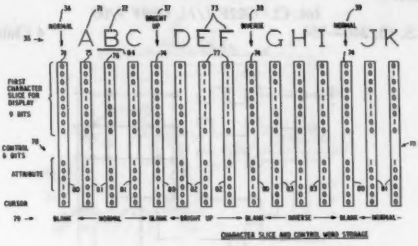
Filed Nov. 2, 1978, Ser. No. 957,371

Claims priority, application United Kingdom, Nov. 16, 1977, 47672/77

Int. Cl.[2] G06F *3/14*

U.S. Cl. 340—723 **10 Claims**

1. A display system utilizing a given display element accessing pattern in which characters may be displayed either in a normal left to right mode or in a reverse right to left mode comprising a display buffer for storing characters to be displayed, a read/write store for storing one complete scan line of character slice bytes as storage words in a predetermined sequence and means to read out the storage words in parallel with constant orientation from said read/write store selectively either in the predetermined sequence or in a reverse sequence to a parallel to serial converter for display, whereby



data is displayed selectively either in a normal left to right mode or in a reverse right to left mode, with individual characters having unchanged orientation, without requiring alteration of said pattern.

4,203,103

BATTERY DETERIORATION INDICATOR FOR AN ELECTRONIC DESK TOP CALCULATOR

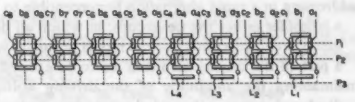
Kazuhiko Osada, Yokohama; Yoshishige Ogawa, Kawasaki, and Ichizo Takimoto, Yokohama, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Japan

Filed Mar. 30, 1978, Ser. No. 891,741

Claims priority, application Japan, Mar. 30, 1977, 52-35704

Int. Cl.[2] G06F *3/14*

U.S. Cl. 340—753 **8 Claims**



1. A battery deterioration indicator for an electronic desk calculator having display units including three column lines and three row lines for enabling a nine-segment display unit, seven of the segments being used to display a character and an eighth segment being used to display a decimal point, the indicator comprising:

means for detecting the progressive deterioration of the voltage level of the battery, including

first means for providing a limiting battery reference voltage level at exhaustion of battery voltage for normal operation of the calculator,

at least one second means for providing at least one predetermined reference voltage representative of at least one stage of deterioration of the voltage level of the battery in advance of the limiting battery voltage level, and

means for comparing the actual voltage level of the battery with said reference voltages and for providing individual signals indicative of the attained reference voltage levels; and

means responsive to said comparing means for displaying the progressive deterioration of the voltage level of the battery including the remaining segment of each of a predetermined number of said display units for respectively indicating the receipt of an individual one of said signals, said remaining segments being arranged in the order of magnitude of said reference voltage levels.

4,203,104

PROCEDURE OF BARGRAPH DISPLAY FOR MEASURED QUANTITIES

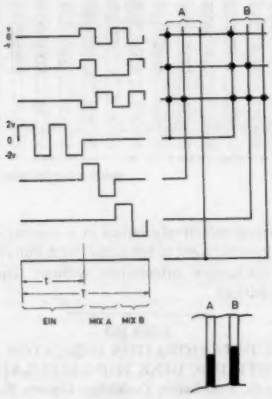
Allan R. Kmetz, Nussbaumen, Switzerland, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed May 26, 1978, Ser. No. 909,724

Claims priority, application Switzerland, Jul. 29, 1977, 9398/77

Int. Cl.[2] G02F *1/13*; G09F *9/00*

U.S. Cl. 340—754 **4 Claims**



1. A process for the display of measured quantities as a bargraph with the help of a row of addressable display elements, comprising the steps of:

interconnecting the display elements on one side into contiguous groups and on the other side according to like position within each group;

addressing in a rapid alternation imperceptible to the eye of a beholder either the on-groups, in which all display elements are to be excited, or the mixed group, in which only a part of the display elements are to be excited; and

maintaining the amplitude of the driving voltage across display elements in the mixed group zero during the strobe interval for the on-groups.

4,203,105

SCANABLE ANTENNA ARRANGEMENTS CAPABLE OF PRODUCING A LARGE IMAGE OF A SMALL ARRAY WITH MINIMAL ABERRATIONS

Corrado Dragone, Little Silver, and Michael J. Gans, Monmouth Beach, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 17, 1978, Ser. No. 906,737

Int. Cl.[2] H01Q *19/13*

U.S. Cl. 343—781 P **8 Claims**

1. A multiple reflector antenna arrangement comprising

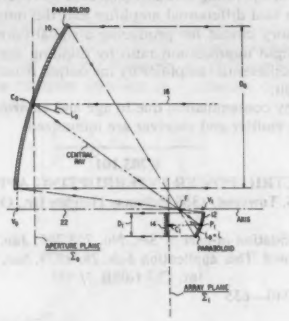
a main parabolic reflector (**10**) comprising a predetermined exit aperture (D_O) and a geometric focal point (F);

a parabolic subreflector (**12**) comprising a geometric focal point (F or F_1) and disposed confocally with a next previous reflector along a transmission path of the atenna arrangement in the direction toward the main parabolic reflector from said parabolic subreflector; and

a feed array (**14**) comprising a plurality of feed elements and directed at the parabolic subreflector

characterized in that

the feed elements of the feed array are disposed substantially on a plane (ξ_1) which is a conjugate plane relative to the exit aperture of the main reflector such that a ray incident at a central point (C_o) of the main reflector from any direction, when reflected by said main reflector essentially



intersects the conjugate plane at said feed array at a central point (C_1).

4,203,106

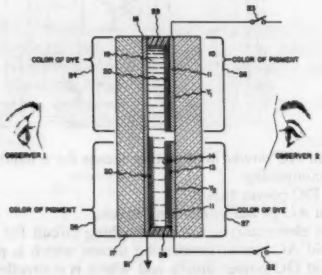
X-Y ADDRESSABLE ELECTROPHORETIC DISPLAY DEVICE WITH CONTROL ELECTRODE

Andrew L. Dalisa, Yorktown Heights, and Barry M. Singer, New York, both of N.Y., assignors to North American Philips Corporation, New York, N.Y.

Filed Nov. 23, 1977, Ser. No. 854,117

Int. Cl.[2] G09F *9/32*

U.S. Cl. 340—787 **10 Claims**



1. An X-Y addressable electrophoretic display device comprising:

a first transparent panel serving as a substrate, one side of which is an exterior viewing side of said display;

a first plurality of spaced apart parallel transparent conductive strips adherent to a major portion of the interior surface of said first panel, said conductive strips serving as column electrodes;

a dielectric insulating layer covering said column electrodes;

a second plurality of spaced apart parallel conductive strips extending transversely to said column electrodes, said second plurality of conductive strips adhering to the other surface of said dielectric insulating layer and serving as row electrodes and as control electrodes;

a plurality of substantially uniformly spaced minute performations in said row electrodes and said dielectric insulating layer;

a second transparent panel corresponding in size to and substantially parallel with said first panel and in spaced apart registration therefrom, one side of which forms an exterior viewing side of said display and the other side of which has an interior plane surface facing the interior side of said first transparent panel;

the interior side of said second transparent panel having a transparent conductive layer adhered thereon forming one continuous electrode layer;

sealing means to enclose the space between said first and second transparent panels, forming a region therebetween;

said enclosed region between said panels being filled with an electrophoretic fluid having pigmented particles homogeneously suspended therein, said particles capable of receiving an electrical charge;

means for furnishing an electrical charge to said pigmented particles;

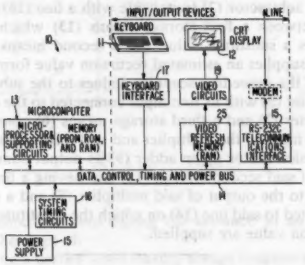
means to supply voltages to said column electrodes, row electrodes and continuous electrode such that the electrical field between said electrodes can be selectively adjusted by the varying voltages on addressed column electrodes and row electrodes and said continuous electrode to establish a threshold on said row electrodes for transporting said charge particles between said continuous electrode and said addressed column electrodes, depending on the direction of the electrical field, resulting in an image to be formed in the addressed intersection regions corresponding to said addressed column electrodes and row electrodes of said display panel.

4,203,107

MICROCOMPUTER TERMINAL SYSTEM HAVING A LIST MODE OPERATION FOR THE VIDEO REFRESH CIRCUIT

Lawrence R. Lovercheck, Palo Alto, Calif., assignor to Zentec Corporation, Santa Clara, Calif.

Filed Nov. 8, 1978, Ser. No. 958,714
Int. Cl.[2] G06K *15/20*
U.S. Cl. 340—799 **14 Claims**



1. Apparatus for refreshing a video display comprising:

(a) a memory for storing list address pointers, lists, and character data, each of said lists including a data address pointer;

(b) a video circuit coupled to said memory for reading a list address pointer at a designated location in said memory to be pointed to one of said lists in said memory and to read the data address pointer of said one list to be pointed to the storage location of character data; and

(c) a video display coupled to said video circuit for displaying the character data to which said video circuit was pointed.

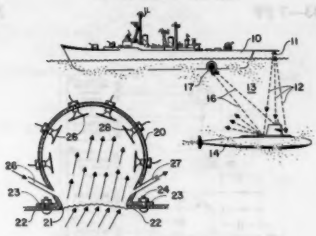
4,203,108

UNDERWATER DETECTION SYSTEM

Hrant Eknayan, 7528 Colombia St., South San Gabriel, Calif. 91770

Filed Aug. 18, 1961, Ser. No. 135,399
Int. Cl.[2] H04B *13/02*
U.S. Cl. 340—850 **1 Claim**

1. A system for detecting the presence and position of submerged objects below the ocean surface, comprising in combination, means for projecting a beam of electro-magnetic rays falling within the 0.4800 to 0.5800 micron wave band in the direction of an object to be detected, a receiver for receiving rays reflected from an object in the path of said projected beam, said receiver comprising a spherically shaped body having an aperture formed in the area which is in contact with the ocean water to permit said reflected rays to enter and impinge on the inner surface of said spherically shaped body,



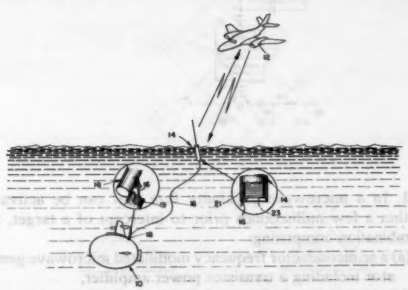
inlet and outlet means for circulating dry cooled constant temperature nitrogen in said spherically shaped body under sufficient pressure to prevent ocean water from entering said spherically shaped body, and a plurality of lead sulfide cells mounted on the inner surface of said sphere for generating an output signal proportional to the intensity and angle of entry of the reflected rays.

4,203,109

SUBMARINE COMMUNICATION SYSTEM

Samuel S. Ballard, Hollis, and Ernest E. Vanham, South Lyndeborough, both of N.H., assignors to Sanders Associates, Inc., Nashua, N.H.

Filed Sep. 28, 1964, Ser. No. 399,640
Int. Cl.[2] H04B *3/60*
U.S. Cl. 340—850 **9 Claims**



1. In a method for communicating information between a submerged vessel and a buoy, the improvement comprising the steps of

A. allowing said buoy to assume substantially the same horizontal velocity as the water in which it is floating,

B. feeding out a communication cable interconnecting said buoy with said vessel at substantially the rate at which the distance between said vessel and said buoy increases,

C. destroying said buoy upon command, and

D. releasing the fed-out cable from said vessel.

4,203,110

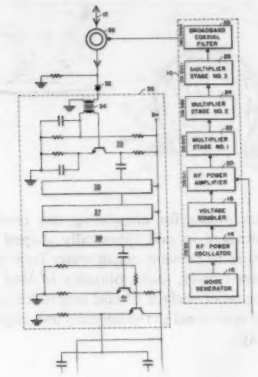
MICROWAVE PROXIMITY FUZE REQUIRING NO WARM-UP TIME AFTER BEING ACTIVATED

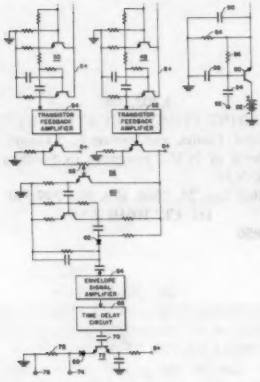
John O. Dick, Riverside, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 12, 1963, Ser. No. 265,022

Int. Cl.[2] F42C *13/04*

U.S. Cl. 343—7 PF **3 Claims**





1. In a microwave proximity fuze that can be activated within a few milliseconds prior to intercept of a target, the combination comprising:

(a) a semiconductor frequency modulated microwave generator including a transistor power amplifier,

(b) a power supply for supplying B+ voltage to said power amplifier,

(c) a silicon controlled rectifier switch connected in series between said power supply and said power amplifier, and having its control electrode connected to a terminal adapted to be connected to a control arming signal source,

(d) bias circuit means connected to said rectifier switch for maintaining a bias voltage sufficient to keep said switch in a non-conducting condition until an arming signal with sufficient voltage to overcome said bias voltage is applied to said switch.

4,203,111

RADAR DEVICE INCLUDING A CIRCUIT ARRANGEMENT FOR REDUCING INTERFERENCE

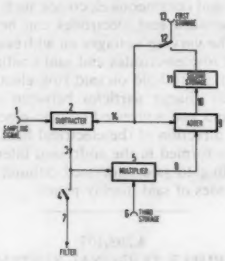
Walter Buehring, Meckenheim, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 13, 1978, Ser. No. 924,162

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1977, 2737088

Int. Cl.[2] G01S *9/42*

U.S. Cl. 343—7.7 **2 Claims**



1. A radar device particularly with a non-constantly scanning radar antenna, wherein a circuit arrangement for reducing the interference echoes due to ground reflection is provided comprising a subtracter **(2)** with a first input to which the scanning values are supplied and with output differential signals which are tapped for further processing, the second input of said subtractor **(2)** switchable with a line **(14)** and a switch **(12)** between a first storage means **(13)** which temporarily supplies a substitute value and a second means storage **(11)** which supplies an estimated recursion value formed by recursion of the preceding scanning values to the subtractor **(2)**, a multiplier **(5)** with its first input connected to the output of the subtracter **(2)** and a third storage means **(6)** connected to the second input of the multiplier and said third storage supplying a recursion factor μ_i, an adder **(9)** its output connected to the input of said second storage **(11)** and having a first input connected to the output of said multiplier **(5)** and a second input connected to said line **(14)** on which the substitute value or the recursion value are supplied.

4,203,112

METHOD AND SYSTEM FOR INCREASING THE DISTANCE WHICH CAN BE UNAMBIGUOUSLY MEASURED BY A RADAR SYSTEM

Berthold Wocher, Leonberg, and Thomas Pfendler, Gerlingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 24, 1978, Ser. No. 908,980

Claims priority, application Fed. Rep. of Germany, May 24, 1977, 2723355

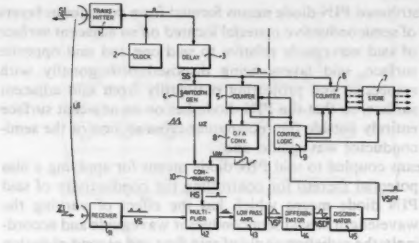
Int. Cl.[2] G01S *7/28, 9/12*

U.S. Cl. 343—13 R **10 Claims**

1. Method for furnishing a distance signal signifying the distance from a radar apparatus location to a target located at less than a predetermined maximum distance from the radar apparatus, in response to a substantially periodic reflected received sequence of radar pulses having a pulse repetition frequency corresponding to the radar pulse repetition frequency of a transmitted radar pulse sequence, comprising, in accordance with the invention, the steps of

creating a sequence of auxiliary pulses having an auxiliary pulse repetition frequency slightly less than said radar pulse repetition frequency and periodically synchronized to said transmitted radar pulse sequence at time periods corresponding to the time required for a radar pulse to travel twice said predetermined maximum distance;

multiplying said received sequence of radar pulses by said sequence of auxiliary pulses thereby creating a multiplier output signal;



creating a sequence of stretched pulses in response to said multiplier output signal;

and furnishing said distance signal under control of said sequence of stretched pulses.

4,203,113

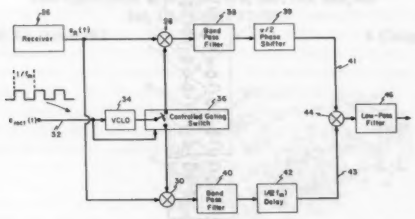
RADAR METHOD AND APPARATUS

Elie J. Baghdady, 21 Overlook Dr., Weston, Mass. 02193

Continuation-in-part of Ser. No. 552,568, Feb. 24, 1975, Pat. No. 4,106,023. This application Aug. 4, 1978, Ser. No. 931,000

Int. Cl.[2] G01S *9/24*

U.S. Cl. 343—14 **20 Claims**



19. A method for determining the distance to an object comprising the steps of:

broadcasting a carrier wave having abrupt frequency shifts;

receiving the carrier wave returned by reflection from the object;

frequency converting a higher frequency portion of the received carrier wave to produce a first signal within a predetermined frequency range;

separately frequency converting a lower frequency portion of the received carrier wave to produce a second signal within the same predetermined frequency range; and

producing a signal related in value to the distance of the object responsive to the phase difference between the first and second signals.

4,203,114

DIGITAL BEARING INDICATOR

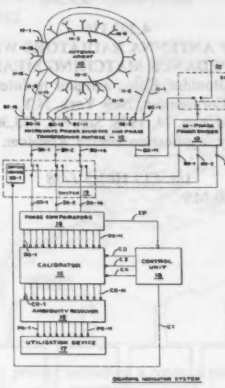
Carl W. Gerst, Skaneateles; Hugh A. Hair, Fayetteville, and Stig L. Rehnmark, Skaneateles, all of N.Y., assignors to Anaren Microwave, Inc., Syracuse, N.Y.

Filed Nov. 13, 1978, Ser. No. 960,243

Int. Cl.[2] H04B *7/00*

U.S. Cl. 343—100 SA **31 Claims**

1. Apparatus for generating a representation of the bearing of a source of microwave energy comprising: an antenna array means having N antenna elements equispaced about an arc of a circle greater than 180° in a plane for receiving microwave energy, where N is an integer; microwave power dividing and phase transforming means having N input ports and a set of output ports, first connecting means for connecting each of the N input ports to a different one of said antenna elements; n two-input port phase comparator means, each of said phase comparator means giving an indication of the phase difference between the signals arriving at their respective input ports, n being an integer greater than 1 and less than N/2; second



connecting means for connecting the input ports of each of said phase comparator means to a different pair of output ports of said microwave power dividing and phase transforming means; and ambiguity resolving means connected to said n phase comparator means for processing said indications of the phase differences to give a multidigit representation of the bearing of a source of microwave energy.

4,203,115

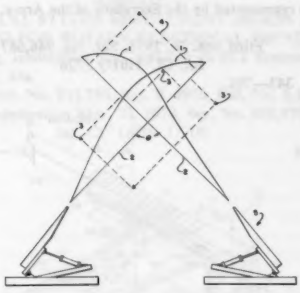
ZERO-DOPPLER SHIFT POSITIONING TECHNIQUE

Joseph F. Hannigan, Springfield, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 11, 1973, Ser. No. 402,491

Int. Cl.[2] G01S *3/02*

U.S. Cl. 343—112 R **9 Claims**



1. A system for determining position location comprising:

a. a pair of projectiles successively propelled along non-parallel, non-circular atmospheric paths;

b. a base station from which said projectiles are propelled;

c. means located selectively on said projectiles and said base station for transmitting carrier and time coded signals from said projectiles and said base station; and

d. observer means including doppler receiver means, means for receiving and storing said time coded signals and means for communicating to a computing means said

received time coded signals corresponding to zero change in said carrier signal as said projectiles travel a predetermined course relative to said base station whereby the position of said observer means at the intersection of perpendiculars to the horizontal subtrack of the projectile trajectories relative to the initial launching position of said projectiles may be determined.

4,203,116

MICROSTRIP ANTENNA RADIATORS WITH SERIES IMPEDANCE MATCHING MEANS

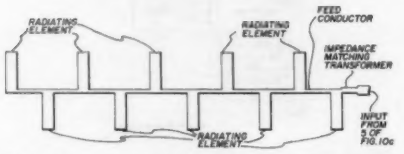
Leonard Lewin, Boulder, Colo., assignor to International Standard Electric Corporation, New York, N.Y.

Filed Aug. 14, 1978, Ser. No. 933,308

Claims priority, application United Kingdom, Sep. 15, 1977, 38545/77

Int. Cl.[2] **H01Q** *1/38*

U.S. Cl. 343—700 MS **6 Claims**



1. A microstrip antenna arrangement comprising:

at least one microstrip half wave length radiating element;

an input microstrip feed line for microwave energy; and

a quarter-wave microstrip line comprising a series of rectangular patches of alternately narrow and wide widths to provide alternating high and low characteristic impedance and said patches being connected in series between said input line and said element, said plurality of patches providing an impedance match between said input line and said element.

4,203,117

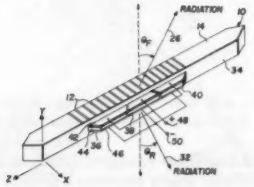
DUAL BEAM LINE SCANNER FOR PHASED ARRAY APPLICATIONS

Harold Jacobs, West Long Branch, and Robert E. Horn, Middletown, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 28, 1978, Ser. No. 946,687

Int. Cl.[2] **H01Q** *3/26*

U.S. Cl. 343—701 **17 Claims**



1. A semiconductor waveguide scanning antenna providing dual beams of radiation, comprising in combination:

a length of semiconductor waveguide of rectangular cross section adapted to propagate wave energy along a longitudinal axis transverse to said cross section and having a plurality of spaced parallel metallic elements selectively located on one surface of said waveguide along its length which act as perturbations that interact with the propagated wave energy to produce a first radiation pattern directed outwardly from said one surface at a predetermined radiation angle and a second radiation pattern at substantially the same said predetermined radiation angle directed outwardly from a surface opposite said one surface;

distributed PIN diode means formed from contiguous layers of semiconductive material located on an adjacent surface of said waveguide relative to said one and said opposite surface, said layers being disposed orthogonally with respect to and projecting outwardly from said adjacent surface, so that the PIN diode lies on an adjacent surface entirely outside the rectangular cross section of the semiconductor waveguide; and

means coupled to said PIN diode means for applying a bias potential thereto for controlling the conductivity of said PIN diode means which has the effect of varying the wavelength of said semiconductor waveguide and accordingly the radiation angle of said first and second radiation pattern.

4,203,118

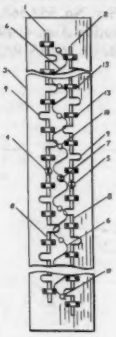
ANTENNA FOR CROSS POLARIZED WAVES

Andrew Alford, 15 Sixth Rd., Woburn, Mass. 01801

Filed Apr. 10, 1978, Ser. No. 895,344

Int. Cl.[2] **H01Q** *9/18*

U.S. Cl. 343—727 **9 Claims**



1. A panel antenna for cross polarized waves comprising:

(a) a metal panel on which are mounted two parallel collinear dipole arrays spaced at a distance between 0.3 wavelength and 0.6 of the wavelength from each other, and

(b) a zigzag antenna located half way between the two collinear arrays with its longitudinal axis parallel to the arrays and located substantially half way between the centers of the two collinear arrays.

4,203,119

THERMAL PRINTERS

Hussein M. Naguib; David R. Baraff, both of Ottawa, and Steven Kos, Hazeldean, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Sep. 5, 1978, Ser. No. 939,385

Int. Cl.[2] **G01D** *15/10;* **H05B** *1/00*

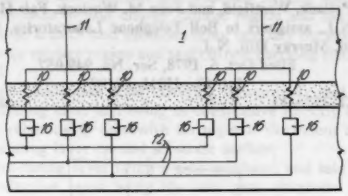
U.S. Cl. 346—76 PH **3 Claims**

1. A thermal printer for printing on a heat-sensitive receptor, the printer comprising:

an array of thick film resistive printing elements and, series-connected to each resistive print element, a respective switching element, each switching element comprising a thick film deposit incorporating vanadium dioxide, the material undergoing a marked resistivity change at a predetermined temperature owing to a change in crystalline structure of said vanadium dioxide; and

addressing circuitry for selectively applying a potential

difference across a combination of a printing element and its series-connected switching element thereby to cause joule heating of said switching element to promote a



reduction in the material resistivity whereupon the series-connected resistive printing element experiences a corresponding increase in potential difference and consequently undergoes joule heating.

4,203,120

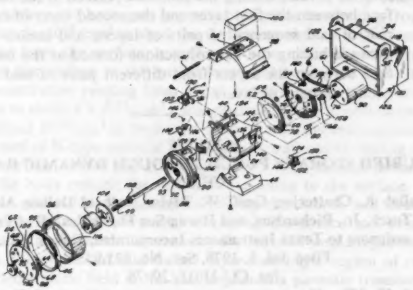
RECORD DRIVE SYSTEM FOR ROTARY ELECTRICAL STYLUS DEVICE

Olin B. King, Huntsville, Ala., assignor to SCI Systems, Inc., Huntsville, Ala.

Division of Ser. No. 611,785, Sep. 9, 1975, Pat. No. 4,100,551. This application Mar. 22, 1978, Ser. No. 888,960

Int. Cl.² G03G *17/00*

U.S. Cl. 346—162 **6 Claims**



1. A rotary electrical character printing device including a rotor, a plurality of styli secured to said rotor, drive means for turning said rotor, record sheet material feed means coupled to said drive means for feeding a strip of said material past said rotor, with the styli contacting said material, at a speed which is directly proportional to the speed of said rotor, means for electrically energizing each of said styli to form dots on said record material, said drive means including a direct-current electrical drive motor, position indicating means driven by said motor in synchronism with said rotor and including a plurality of periodically-spaced indicia for each of said characters for producing sequential electrical signals upon the detection of corresponding associated indicia, thereby ensuring synchronization between each one of said indicia and an associated one of said dots, and control means utilizing said signals to control the timing of the energizing of said styli, whereby the spacing of dots within each character is substantially independent of the speed of said motor.

4,203,121

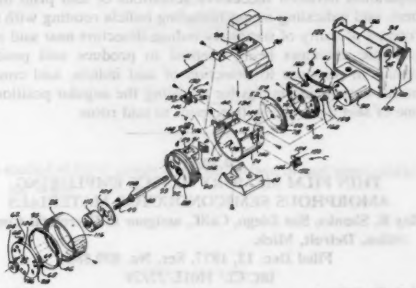
ROTARY ELECTRICAL PRINTER AND METHOD USING DOT-BY-DOT SYNCHRONIZATION

Olin B. King, Huntsville, Ala., assignor to SCI Systems, Inc., Huntsville, Ala.

Division of Ser. No. 611,785, Sep. 9, 1975, Pat. No. 4,100,551. This application Mar. 22, 1978, Ser. No. 888,969

Int. Cl.² G03G *17/00*

U.S. Cl. 346—162 **6 Claims**



1. In a rotary printer including a rotor, a plurality of electrically actuatable print members secured to said rotor and spaced apart from one another on said rotor, drive means for rotating said rotor and thereby moving said print members across a record surface to be printed upon, indicating means for producing electrical position signals indicating the position of said rotor, actuating means responsive to said position signals for selectively electrically actuating each of said print members when said rotor is in a pre-determined position, said print members being adapted to print images by forming dots on said record surface, said indicating means including indicia, the spacing of said indicia corresponding to the desired spacing of dots on said record surface, there being one of said indicia for each of said dots, so as to produce each of said position signals in response to one of said indicia to thus precisely control the location of said dots, whereby the timing of the formation of each dot is controlled by the actual position of said rotor and is substantially independent of the rotor speed.

4,203,122

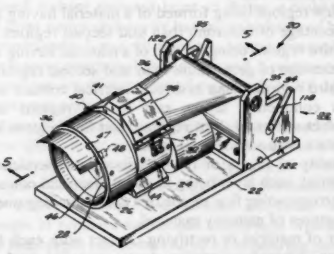
ELECTRICAL STYLUS ADJUSTMENT MEANS AND METHOD FOR ROTARY ELECTRICAL PRINTER

Olin B. King, Huntsville, Ala., assignor to SCI Systems, Inc., Huntsville, Ala.

Division of Ser. No. 611,785, Sep. 9, 1975, Pat. No. 4,100,551. This application Mar. 22, 1978, Ser. No. 888,970

Int. Cl.² G03G *17/00*

U.S. Cl. 346—162 **4 Claims**



1. In a rotary printer including a rotor, a plurality of electrically actuatable print members secured to said rotor and spaced apart from one another on said rotor, drive means for

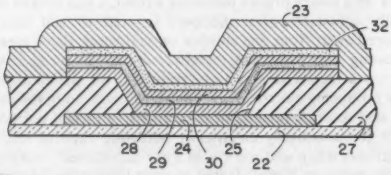
rotating said rotor and thereby moving said print members across a record surface to be printed upon, indicating means for producing electrical position signals indicating the position of said rotor, actuating means responsive to said position signals for selectively electrically actuating each of said print members when said rotor is in a pre-determined position, control means for changing the position of the printing produced on said record surface by at least one of said printing members, said control means comprising means for changing the time separation between successive actuations of said print members, said indicating means including indicia rotating with said rotor, a plurality of stationary indicia detectors near said indicia, said detectors being adapted to produce said position signals in response to detection of said indicia, said control means comprising means for adjusting the angular position of one of said detectors with respect to said rotor.

4,203,123

THIN FILM MEMORY DEVICE EMPLOYING AMORPHOUS SEMICONDUCTOR MATERIALS

Roy R. Shanks, San Diego, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Dec. 12, 1977, Ser. No. 859,580
Int. Cl.[2] H01L *27/24*
U.S. Cl. 357—2 **3 Claims**



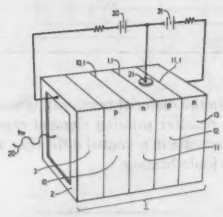
1. A thin film memory device on a substrate, comprising:
a plurality of first conductive layers forming a plurality of parallel first conductors;
a plurality of second conductive layers forming a plurality of parallel second conductors perpendicular to said first conductors;
each of said first conductive layers serving as a first electrode;
a plurality of structures of memory material mounted in electrical contact with said first electrode at the intersection of each of said first and second conductors, which structures have first, second, and third regions;
said second regions being formed of a tellurium germanium based chalcogenide which has a higher electrical resistance in its amorphous state and a lower electrical resistance in its crystalline state and can be switched from one state to the other upon application of an electrical signal of appropriate value;
said first regions being formed of a material having a higher percentage of tellurium than said second regions;
said third regions being formed of a material having a higher percentage of germanium than said second regions;
said third regions being in direct electrical contact with said first conductive layers; said second regions being in contact with said third regions, said first regions being in contact with said second regions;
a plurality of layers of N-type amorphous semiconductor material, each layer being in direct electrical contact with a corresponding first region of a corresponding one of said structures of memory material,
a layer of material in rectifying contact with each layer of N-type amorphous semiconductor material, each of said second conductive layers serving as a second electrode in direct electrical contact with said layers of material in rectifying contact with said layers of N-type amorphous semiconductor material.

4,203,124

LOW NOISE MULTISTAGE AVALANCHE PHOTODETECTOR

James P. Gordon, Rumson; Robert E. Nahory, Lincroft; Martin A. Pollack, Westfield, and John M. Worlock, Fair Haven, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 6, 1978, Ser. No. 949,057
Int. Cl.[2] H01L *29/90*
U.S. Cl. 357—13 **24 Claims**



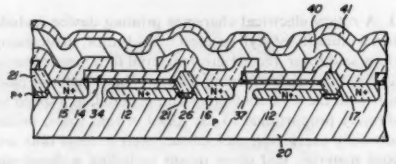
6. A reduced noise avalanche detector comprising:
a substrate and a plurality of abutting layers of semiconductor material of alternating opposed conductivity type, said layers being grouped into a sequence of pairs of layers;
characterized in that:
the bandgap of the first layer and the bandgap of the second layer of each pair of said sequence of pairs of layers are substantially equal;
the bandgaps of each pair of said sequence of pairs of layers are arranged in a decreasing sequence of sizes;
and said reduced noise avalanche detector further comprises means for reverse biasing the junctions formed at the interface between the first layer and the second layer of each pair of said sequence of pairs of layers; and means for forward biasing the heterojunctions formed at the interface between the layers from different pairs of said sequence of pairs of layers.

4,203,125

BURIED STORAGE PUNCH THROUGH DYNAMIC RAM CELL

Pallab K. Chatterjee; Geoff W. Taylor, both of Dallas; Al F. Tasch, Jr., Richardson, and Horng-Sen Fu, Dallas, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 3, 1978, Ser. No. 921,933
Int. Cl.[2] H01L *29/78*
U.S. Cl. 357—41 **8 Claims**



1. A semiconductor device comprising:
a substrate of a first conductivity type semiconductor material;
a buried charge storage region of the opposite conductivity type disposed in said substrate wholly below the surface thereof;
a second region of said opposite conductivity type disposed in said substrate in laterally spaced relation from said charge storage region, said second region opening onto

the surface of said substrate and defining a current carrying electrode;

an insulating layer of substantially uniform thickness on the surface of said substrate and disposed directly above the entire area of said charge storage region and the entire surface area of said substrate lying laterally between said charge storage region and said current carrying electrode; and

a single conductive layer covering substantially said entire insulating layer and being in coextensive directly engaging relationship therewith throughout the extent of said insulating layer on said substrate surface;

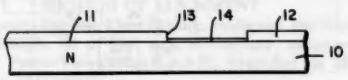
said insulating layer being a gate insulator, and said single conductive layer being the sole gate electrode of the device.

4,203,126

CMOS STRUCTURE AND METHOD UTILIZING RETARDED ELECTRIC FIELD FOR MINIMUM LATCH-UP

Ernest W. Yim, Sunnyvale, and Paul G. G. VanLoon, San Jose, both of Calif., assignors to Siliconix, Inc., Santa Clara, Calif.

Filed Nov. 13, 1975, Ser. No. 631,729
Int. Cl.[2] H01L *27/02*
U.S. Cl. 357—42 **6 Claims**



6. In a CMOS field effect transistor structure: a body of N-type semiconductor material having a generally planar surface and a resistivity no greater than about 0.7 ohm-cm, a buried layer of P-type material formed within the body below the surface and having an impurity concentration ranging from about $5\times10^{18}/cm^3$ toward the surface to about $8\times10^{15}/cm^3$ away from the surface, a well of P-type material extending from the surface to the buried layer and having an impurity concentration ranging from about $2\times10^{16}/cm^3$ near the surface to about $8\times10^{15}/cm^3$ a few microns from the surface and to about $10^{18}/cm^3$ at the buried layer, source and drain regions formed of N-type material formed in the well and extending to the surface, source and drain regions of P-type material formed in the body outside the well and extending to the surface, a layer of insulating material overlying the source and drain regions, and gate electrodes overlying the source and drain regions and spaced therefrom by the layer of insulating material, said well and said buried layer forming a region of retarded electric field in the base region of a parasitic transistor formed by the N-type source or drain region, the P-type well and the N-type body, the retarded field serving to reduce the current gain of the parasitic transistor and thereby prevent undesired SCR action in said transistor.

4,203,127

PACKAGE AND METHOD OF PACKAGING SEMICONDUCTOR WAFERS

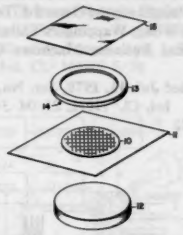
Bruce R. Tegge, Jr., Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 816,778, Jul. 18, 1977, abandoned. This application Mar. 2, 1979, Ser. No. 17,202
Int. Cl.[2] H01L *29/06, 23/02, 23/12*
U.S. Cl. 357—55 **3 Claims**

1. A package for a semiconductor wafer or a portion thereof wherein said wafer is comprised of a plurality of separate and individual die, said package comprised of:

a first sheet having a surface to contact a first surface of the semiconductor wafer;

an adhesive backed ring affixed to said surface of said first sheet and positioned to surround said semiconductor wafer, said ring having a thickness sufficient to extend above and protect said semiconductor wafer and sufficient to remain rigid and approximately flat; and



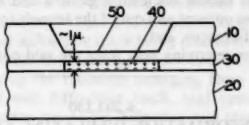
a second sheet to cover a second surface of said semiconductor wafer.

4,203,128

ELECTROSTATICALLY DEFORMABLE THIN SILICON MEMBRANES

Henry Guckel, Madison, Wis., and Steven T. Larsen, Albany, Oreg., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Continuation-in-part of Ser. No. 739,583, Nov. 8, 1976, abandoned. This application Sep. 21, 1978, Ser. No. 944,637
Int. Cl.[2] H01L *29/04, 29/06, 29/84, 27/12*
U.S. Cl. 357—60 **20 Claims**



1. An electro-mechanical capacitive device comprising:

(a) a first substrate of crystalline silicon having opposite sides, a portion of one side having boron diffused therein to a selected depth having a layer between 1 and 10 microns in thickness with boron atom concentrations sufficient to render the layer conductive and resistant to etching by selected silicon etchants, a cavity formed in the opposite side of said substrate bottoming on the boron diffused etchant resistant layer to define a diaphragm in said layer under said cavity having a thickness of between approximately 1 and 10 microns, lateral dimensions between approximately 1 millimeter and 2 centimeters, and internal tension of the order of magnitude of 10^5 dynes per centimeter; and

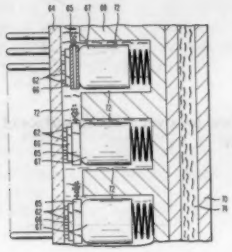
(b) a second electrode spaced away and insulated from the boron diffused layer side of said diaphragm at a distance selected such that mechanical deflection of said diaphragm will measurably change the capacitance between said diaphragm and said second electrode, whereby changes in pressure across said diaphragm which deflect said diaphragm can be measured by measuring the change in capacitance between said diaphragm and second electrode, and whereby an oscillating electrical signal applied between said diaphragm and said second electrode will induce mechanical vibration of said diaphragm to provide an effective resonant impedance to the electrical signal.

4,203,129

BUBBLE GENERATING TUNNELS FOR COOLING SEMICONDUCTOR DEVICES

Sevgin Oktay, Poughkeepsie; Gerard J. Torgersen, Pawling, and Alexander C. Wong, Wappingers Falls, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 11, 1978, Ser. No. 923,592
Int. Cl.[2] H01L *25/04, 39/02*
U.S. Cl. 357—82 **28 Claims**



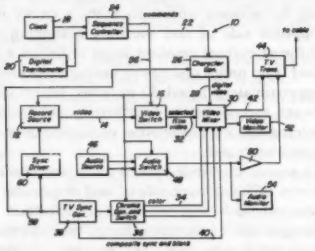
1. A liquid encapsulated module comprising:
a plurality of heat generating devices on a substrate;
a container attached to said substrate in sealed relationship such that the substrate forms a vertical side wall to the inside of said container;
a heat sink composed of a heat conducting body having a plurality of vertically oriented tunnels therein formed on one side of said heat generating components;
a low boiling point liquid partially filling said container and completely covering said heat generating components;
a vapor space above the liquid surface level;
said tunnels being of such dimension so as to provide enhanced bubble nucleation growth and the movement of bubbles upward and out of the tunnels to promote cooling of said devices; and
means for removing heat from the said container.

4,203,130

INFORMATION DISPLAYING SYSTEM

Joseph A. Doumit, New Iberia, La., and Robert E. Weiblen, Towson, Md., assignors to Dial-A-Channel, Inc., New Iberia, La.

Filed Jan. 11, 1977, Ser. No. 758,553
Int. Cl.[2] H04N *9/02*
U.S. Cl. 358—1 **19 Claims**



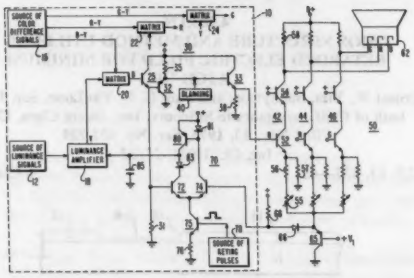
1. A system for continuously transmitting program schedule information over an informational television channel including a plurality of data sources, video mixing means connected to said sources for combining information received therefrom to produce a composite video modulating output, sequence control means connected to said sources for selection of the information fed to the mixing means, and clock means connected to the sequence control means for timing and updating the selected information fed to the mixing means.

4,203,131

PREDICTABLE AUTOMATIC BRIGHTNESS CONTROL CIRCUIT IN A VIDEO SIGNAL IMAGE REPRODUCING SYSTEM

Leopold A. Harwood, Bridgewater; Erwin J. Wittmann, North Plainfield, both of N.J., and Robert L. Shanley, II, Indianapolis, Ind., assignors to RCA Corporation, New York, N.Y.

Filed Jan. 31, 1979, Ser. No. 8,050
Int. Cl.[2] H04N *5/16*
U.S. Cl. 358—34 **13 Claims**



1. In a video signal processing system including a video signal channel for processing an image representative video signal having periodically recurring image intervals, and blanking intervals disposed between adjacent image intervals and containing a blanking level determinative of image brightness; a kinescope for reproducing images in response to video signals applied thereto; and kinescope amplifier means for coupling video signals from said channel to said kinescope; automatic brightness control apparatus comprising:
comparator means having first and second inputs for comparing, during said blanking intervals, signals applied to said inputs to provide an output control signal indicative of the difference in magnitude between the input signals;
means coupled to said kinescope amplifier means for providing a substantially fixed reference potential to which video signals amplified by said kinescope amplifier means are referenced;
means for coupling a substantially fixed reference voltage derived from said reference potential to said first input of said comparator means;
means for coupling video signals from said channel to said second input of said comparator means; and
means for coupling said output of said comparator means to said channel, for varying said blanking level in a direction to reduce the difference between said derived input reference voltage and the blanking level of said input video signal to a minimum.

10. In a color television receiver including a video signal transmission path for processing a color image representative video signal, said transmission path including a luminance channel for processing a luminance component of said video signal having periodically recurring image intervals and image blanking intervals disposed between adjacent image intervals and containing a blanking level determinative of image brightness, and a chrominance channel for processing a chrominance component of said video signal; means for combining signals processed by said luminance and chrominance channels; a kinescope for reproducing images in response to video signals applied thereto; and kinescope amplifier means for coupling combined video signals from said combining means to said kinescope; apparatus comprising:

a source of keying signals coincident with a portion of said blanking interval containing said blanking level;

comparator means responsive to said keying signals and having first and second inputs for comparing, during said portion of said blanking intervals, signals applied to said inputs to provide an output control signal indicative of the difference in magnitude between said input signals;

means coupled to said kinescope amplifier means for providing a substantially fixed reference potential to which signals amplified by said kinescope amplifier means are referenced;

means for coupling a substantially fixed reference voltage derived from said reference potential to said first input of said comparator means;

means for coupling output signals from said combining means to said second input of said comparator means; and

means for coupling said output of said comparator means to said video signal transmission path, for varying said blanking level in a direction to reduce the difference between said derived input voltage and the blanking level of said input video signal to a minimum.

4,203,132

METHOD OF ALIGNMENT

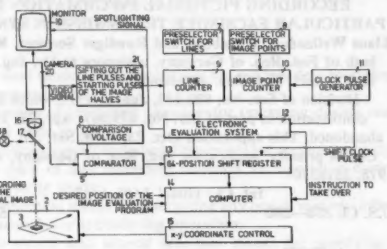
Alfons Schmitt, Talheim; Klaus Schäfer, Heilbronn, and Diether Utz, Öhringen, all of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 29, 1977, Ser. No. 837,889

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1976, 2643810

Int. Cl.[2] H04N 7/00

U.S. Cl. 358—101 **15 Claims**



1. A method of aligning the connection contacts of a semiconductor component with the contact fingers of a contacting strip in an alignment system, comprising: moving the contacting strip and the semiconductor component out of alignment by defined distances which are so large that the alignment position of the contacting strip is not coincident with and does not overlap the alignment position of the semiconductor component; producing an image of the actual locations of the two alignment positions thus separated and breaking the image down into image points the spacing of which image points is smaller than the required alignment accuracy; digitalizing and storing the information content of the image points; while taking into account the defined movement out of adjustment which has been undertaken, comparing the locations of the two alignment positions in a data processing system and calculating their deviations; and displacing the parts to be aligned with respect to each other by the amount of the calculated deviations from the desired position of coincidence of the two alignment positions, while taking into account the defined movement out of alignment, with the aid of movement devices controlled by the data processing system.

4,203,133

OPTICAL PLAYER WITH HALF WAVE PLATE

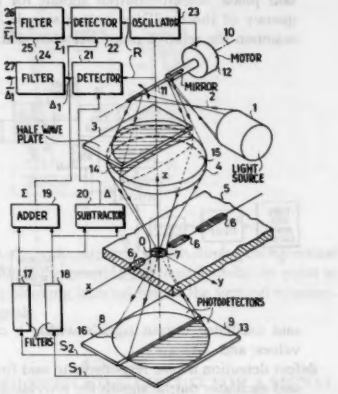
Claude Bricot, and Jean-Claude Lehureau, both of Paris, France, assignors to Thomson-Brandt, Paris, France

Filed Apr. 2, 1976, Ser. No. 673,057

Claims priority, application France, Apr. 4, 1975, 75 10624

Int. Cl.[2] H04N 5/76

U.S. Cl. 358—128.5 **11 Claims**



1. A system for reading out a record by point optical scanning of a diffractive track carried by said record, and along which information items are transcribed, said system comprising: means causing said record to displace in front of a read-out head, said read-out head comprising a source furnishing monochromatic radiation, and optical means focussing said monochromatic radiation for forming a read-out beam; said read-out beam having a point of convergence positioned close to the optical axis of said optical means and in immediate proximity of the element of said diffractive track being read at the time; said read-out head further comrpising at least two photodetector elements picking up the radiation emerging from the illuminated portion of said diffractive track; said system further comprising deflection means for deflecting said read-out beam positioned between said source and said record for causing said point of convergence to displace transversely in relation to the longitudinal axis of said diffractive track; a half-wave plate intercepting one of the halves of said read-out beam; said halves being generated by said half wave plate, and obtained by partitioning said read-out beam with a plane containing said optical axis and perpendicular to the direction of displacement of said point of convergence; an electrical generator being connected to said deflection means for imparting to said point of convergence an oscillatory motion; synchronous detector means being connected to said electrical generator and to said photodetector elements for supplying signals representing positional errors on the part of said point of convergence, in relation to said longitudinal axis.

4,203,134

FM SIGNAL DEMODULATOR WITH DEFECT DETECTION

Todd J. Christopher, Indianapolis, Ind., and Tsan H. Lin, Millsboro, Del., assignors to RCA Corporation, New York, N.Y.

Filed Oct. 2, 1978, Ser. No. 948,013

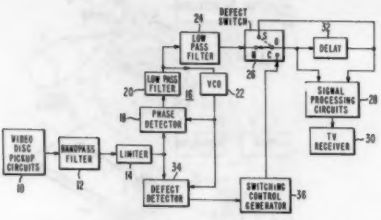
Int. Cl.[2] H04N 5/76, 5/78

U.S. Cl. 358—128.5 **8 Claims**

1. In a signal translating system including a source of carrier waves, the instantaneous frequency of said carrier waves being subject to variation over a given deviation range, said source being randomly subject to occasions of defective operation during which the apparent instantaneous frequency of said

carrier waves departs from said given deviation range, the apparatus comprising:

a phase locked loop having a phase detector and a voltage controlled oscillator, said phase detector being responsive to first signals corresponding to said carrier waves and to the output signals of said oscillator for providing output signals dependent upon the phase relationship between the signals applied thereto, said oscillator being responsive to said phase detector output signals for altering the frequency of the oscillator output signals in a direction to maintain the relative phase between said first signals and



said oscillator output signals within a certain range of values; and

defect detection means responsive to said first signals and to said oscillator output signals for providing a defect indication signal when the relative phase between said first signals and said oscillator output signals departs from a given range of values, said departure corresponding to an occurrence of said occasions of defective operation, and for providing a reference level signal when the relative phase between said first signals and said oscillator output signals is within said given range of values.

4,203,135

EXTERNAL SYNCHRONIZING SIGNAL GENERATING CIRCUIT FOR A COLOR TELEVISION CAMERA

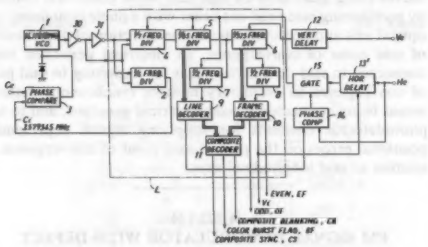
Takashi Sasaki, Higashiosaka, Japan, assignor to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed Jan. 19, 1978, Ser. No. 870,828

Claims priority, application Japan, Jan. 27, 1977, 52-9496[U]; Jun. 30, 1977, 52-88428[U]

Int. Cl.[2] H04N *5/04, 9/46*

U.S. Cl. 358—149 **7 Claims**



1. A synchronizing signal generator responsive to an external synchronizing signal including an external subcarrier signal, an external horizontal synchronizing signal and an external vertical synchronizing signal for a television signal, comprising:

reference oscillator means phase controlled in response to said external subcarrier signal for generating an internal reference signal,

first frequency dividing means for frequency dividing said internal reference signal said first frequency dividing means being reset in response to said external horizontal synchronizing signal at each horizontal period,

line decoder means coupled to said first frequency dividing means for decoding the frequency divided output of said first frequency dividing means for providing an internal horizontal synchronizing signal,

second frequency dividing means for frequency dividing said reference signal said second frequency dividing means being reset in response to said external vertical synchronizing signal at each vertical period,

frame decoder means coupled to said second frequency dividing means for decoding the frequency divided output of said second frequency dividing means for providing an internal vertical synchronizing signal,

phase comparator means for comparing the phases of said external and internal horizontal synchronizing signals,

gate means coupled to said first frequency dividing means for controlling the application, of said external horizontal synchronizing signal therethrough to said first frequency dividing means and for preventing the application of said external horizontal synchronizing signal in response to the output of said phase comparing means, whereby said external horizontal synchronizing signal is prevented from being applied to said first frequency dividing means when the phases of said external and internal horizontal synchronizing signals coincide with each other, and

variable delay means coupled to said gate means and to said frame decoder means, said variable delay means controlling the delay of the application of external horizontal synchronizing signal to said gate means in response to the internal vertical synchronizing signal output of said frame decoder means.

4,203,136

METHOD AND APPARATUS FOR ELECTRO-OPTICALLY SENSING, TRANSMITTING AND RECORDING PICTORIAL INFORMATION IN PARTICULAR FACSIMILE TRANSMISSION SYSTEMS

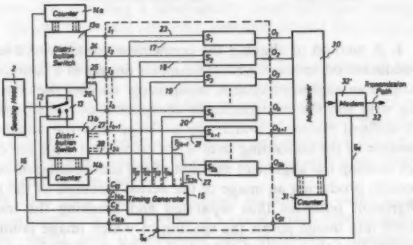
Klaus Wellendorf, Kitzeberg, and Rwediger Sommer, Raisdorf, both of Fed. Rep. of Germany, assignors to Dr. Ing. Rudolf Heil GmbH, Fed. Rep. of Germany

Division of Ser. No. 803,143, Jun. 3, 1977, which is a continuation-in-part of Ser. No. 679,087, Apr. 21, 1976, abandoned. This application Oct. 23, 1978, Ser. No. 953,766

Claims priority, application Fed. Rep. of Germany, Apr. 25, 1975, 2518370

Int. Cl.[2] H04N *1/40, 1/18*

U.S. Cl. 358—280 **5 Claims**



1. A transmitter including a flat-bed sensor for optic-electric sensing and recordation of picture patterns comprising, a sensing head means with multiple optic-electric converter means mounted for scanning the picture pattern line-by-line and capable of being advanced between scans, said multiple optic-electric converter means arranged in a row in the sensing head means, which row is perpendicular to the movement direction of said head means, and including a sensing line associated with each converter means, a plurality of shift register means connected to the converter means and the converter means are

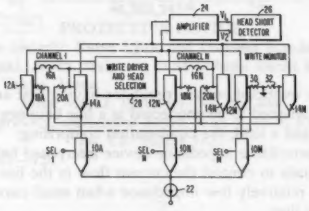
interrogated in synchronism and picture signals of sensed picture dots are supplied one after the other to the shift register means and correspond to the converter means which scan different lines in succession during interrogation including an advancing system means which after the scanning of the pattern by the sensing head means causes a relative step movement between the pattern and the sensing head means, comprising distribution switch means connected between said sensing lines and plurality of shift register means and the number of shift register means being equal to two times the number of converter means, said distribution switch means arranging said picture signals supplied to respective shift register means so that they are sorted line-by-line and stored in said shift register means and a multiplexer means connected to said shift register means and having an output wherein the output of said shift register means occurs one after the other.

4,203,137

DUAL MODE READ PREAMPLIFIER WITH ELECTRICAL SHORT DETECTOR

John W. Beck, Santa Cruz, and Donald P. McCown, Morgan Hill, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 17, 1978, Ser. No. 934,443
Int. Cl.[2] G11B *27/36, 5/09*
U.S. Cl. 360—31 **9 Claims**



1. A dual mode read preamplifier for use in a data recording system comprising;

a plurality of recording channels for operating during read and write modes;

a monitor channel including first resistance means connected to each of said recording channels for operation during the write mode;

first selection means for energizing any one of said recording channels for transducing operation;

write driver and second selection means for supplying a write signal to a selected recording channel; and

second resistance means coupled to the inputs of said recording channels and connected to said first resistance means for attenuating said write signal, and for providing isolation between a selected energized recording channel and the others of said recording channels.

4,203,138

VIDEO SIGNAL RECORDING SYSTEM WITH DELAYED VERTICAL SYNC

William J. Elenbaas, 130 S. Pine St., McBain, Mich. 49657

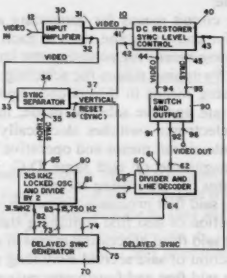
Filed Jul. 14, 1978, Ser. No. 924,798
Int. Cl.[2] H04N *5/78*
U.S. Cl. 360—37 **16 Claims**

1. A system for recording composite video signals using a helical tape recorder which has a head switchover point occurring before the vertical sync signals after vertical blanking starts to eliminate line distortion caused by the head switching comprising:

input means for receiving composite video signals from a camera;

output means for applying video and delayed synchronization signals to a multiple head helical tape recorder in which the head switchover point occurs a predetermined time prior to the vertical synchronization signals; and

a delayed vertical synchronization signal circuit coupled between said input and output means for providing de-



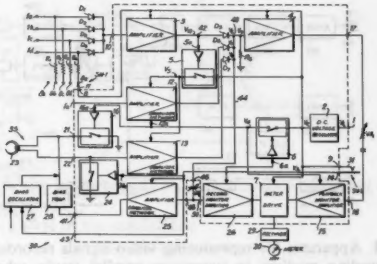
layed vertical synchronization signals during each vertical blanking interval to position the head switchover point in the vertical blanking interval before the vertical synchronization signals.

4,203,139

PLAY/RECORD SWITCHING CIRCUIT FOR A SIGNAL REPRODUCING AND RECORDING APPARATUS

Harumi Horiuchi, Yokohama, Japan, assignor to Soundesign Corporation, Jersey City, N.J.

Filed Aug. 14, 1978, Ser. No. 933,268
Claims priority, application Japan, Sep. 10, 1977, 52-109154
Int. Cl.[2] G11B *15/12*
U.S. Cl. 360—62 **12 Claims**



1. A play/record switching circuit for an electrical signal reproducing and recording apparatus of the type having inputs for a plurality of source data signals and a microphone data signal, and tape head means for generating a tape head reproducing signal and for receiving one of said data signals to be recorded, said switching circuit comprising:

(a) switching-state selector means for selecting between a first switching state in which one of said source data signals is selected, and a second switching state in which one of said microphone data signal and said tape head reproducing signal is selected;

(b) mode-selector means constituting a single mechanical switch which is solely responsive for selecting between a play and a record mode of operation for the apparatus;

(c) first actuatable electronic means for processing the selected one of said source data signals to thereby generate a processed source data signal;

(d) second actuatable means for processing the selected microphone data signal to thereby generate a processed microphone data signal;

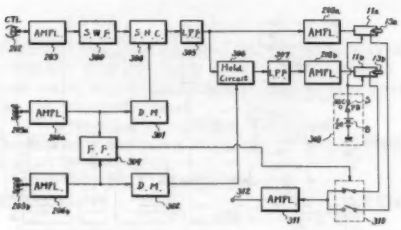
(e) third actuatable means for processing the selected tape head reproducing signal to thereby generate a processed tape head reproducing signal in said play mode;
(f) fourth actuatable means for processing one of said data signals to be recorded by said tape head means in said record mode;
(g) electronic circuit means for generating a D.C. voltage signal and for conveying the same to each of said actuatable processing means for actuating the latter; and
(h) electronic switching means for selecting at least one of said processing means in dependence upon the selected switching state and the selected mode, including logic-controlled electronic switches electrically connected to said electronic circuit means and operative in dependence upon the magnitude of said same D.C. voltage signal which actuates the processing means
for selecting said first processing means in said play mode upon selection of said first switching state,
for selecting said third processing means in said play mode upon selection of said second switching state,
for selecting said first and fourth processing means in said record mode upon selection of said first switching state, and
for selecting said second and fourth processing means in said record mode upon selection of said second switching state.

4,203,140

HELICAL SCAN VTR WITH DEFLECTABLE HEAD

Yoshimi Watanabe, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 635,139, Nov. 25, 1976, abandoned. This application Oct. 26, 1977, Ser. No. 845,558
Claims priority, application Japan, Nov. 26, 1974, 49-136554
Int. Cl.[2] G11B *21/10*
U.S. Cl. 360—77 **6 Claims**



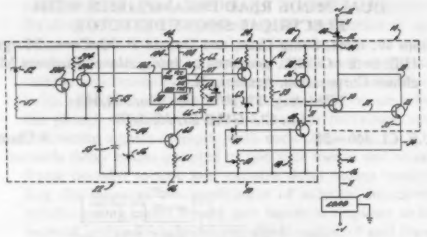
1. Apparatus for reproducing video signals recorded on a recording medium in successive parallel tracks which are skewed relative to a direction of movement of said medium, said apparatus comprising:
signal transducer means repeatedly scanning said recording medium in a direction generally along said tracks for reproducing the video signals from said successive tracks upon said movement of the medium;
controllable support means movably supporting said signal transducer means and being responsive to variations in a tracking control signal for displacing said transducer means from a neutral position in first and second opposed directions respectively extending transversely with respect to the tracks, said support means having predetermined limits of its displacement of said transducer means in said first and second directions from said neutral position; and
control signal generating means for providing said tracking control signal and being normally operative, upon mistracking of said transducer means relative to a track, to vary said tracking control signal in the sense for causing said support means to displace said transducer means in a respective one of said directions for restoring correct tracking of said track by said transducer means, said control signal generating means including means operative upon displacement of said transducer means to said limit thereof in one of said directions for varying said tracking control signal in the sense for causing said support means to displace said transducer means in the other of said directions substantially to the respective limit thereof.

4,203,141

LOW POWER DISSIPATION SERIES REGULATOR FOR PCM REPEATER LINES

Larry D. Bishop, Colleyville, Tex., and Jack C. Parker, Jr., Bolingbrook, Ill., assignors to Wescom, Inc., Downers Grove, Ill.

Filed Mar. 30, 1978, Ser. No. 891,531
Int. Cl.[2] H02H *3/08*
U.S. Cl. 361—18 **3 Claims**



1. In an overload current regulator having first and second terminals adapted to be connected in a line between a voltage potential and a load, the combination comprising:
(a) a controllable impedance device interposed between the terminals to control the current flow in the line and having a relatively low impedance when small currents flow in the line;
(b) sensing means in series with the impedance device for sensing the current flowing in the line and operatively connected to the impedance device to increase the impedance thereof to limit the current flowing in the line to a predetermined maximum level;
(c) a timer having inputs connected between the two terminals and an output operatively connected to the impedance device to control the impedance thereof, the timer in sequence being activated when the current flowing in the line has reached the maximum level, timing out a first predetermined time, increasing the impedance of the device to a maximum level to inhibit current flow in the line, timing out a second predetermined time, and decreasing the impedance of the device to the aforementioned relatively low impedance; and
(d) timer control means connected across the two terminals and operatively connected to the timer for assuring that the timer is initialized before the timer is activated.

4,203,142

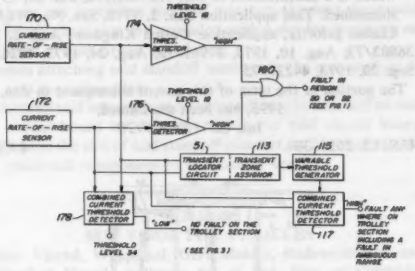
GROUND FAULT SYSTEM AND METHOD OF DETECTION

Donald E. Lee, 2033 Parkview Ave., Abington, Pa. 19001

Filed Jul. 31, 1978, Ser. No. 929,712
Int. Cl.[2] H02H *3/32*
U.S. Cl. 361—42 **13 Claims**

1. A ground fault detection system for detecting and distinguishing ground faults from normal loads on a line between at least two power substations, comprising:
(a) first current rate of rise sensor means coupled to a first of said power substations;
(b) second current rate of rise sensor means coupled to a second of power substations;

(c) first threshold detection means coupled to at least one of said current rate of rise sensor means for indicating a ground fault condition within a first predetermined distance range on said line close in to one of said power substations; and,



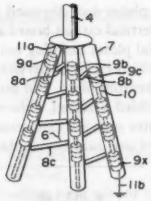
(d) second threshold detection means coupled to said current rate of rise sensors for indicating an absence of a ground fault condition at any location or distance range between said first and second power substations.

4,203,143

PROTECTIVE DEVICE

Mitsumasa Imataki; Katsu Ujita, and Tsutomu Egashira, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 3, 1978, Ser. No. 902,449
Claims priority, application Japan, May 7, 1977, 52-52191
Int. Cl.[2] H02H *3/22*
U.S. Cl. 361—120 **5 Claims**



1. A protective device for protecting from abnormal voltage which comprises an earthing cylindrical metallic casing; an electrode or conductive substrate which is disposed in the direction of the axis of the metallic casing; an insulating pipe which is disposed between the metallic casing and the electrode or the conductive substrate; and a plurality of non-linear resistors which are disposed in said insulating pipe wherein said non-linear resistors are respectively connected so as to be substantially similar to the potential distribution in said metallic casing.

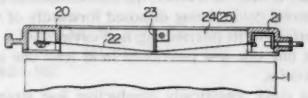
4,203,144

CORONA CHARGER FOR IMAGE TRANSFER

Toyoo Okamoto, Yokohama, Japan, assignor to Ricoh Company, Ltd., Japan

Filed May 17, 1978, Ser. No. 906,829
Claims priority, application Japan, May 20, 1977, 52-58348
Int. Cl.[2] H01T *19/04*
U.S. Cl. 361—234 **11 Claims**

1. A corona charger for transfering a visible toner image on a photoconductor to a transfer sheet comprising a corona wire stretched between a pair of insulating support members, said corona wire being curved outwardly at the central portion thereof and the curved portion of said corona wire being directed in the direction opposite to a transfer sheet transport direction so that a central portion of the transfer sheet is charged first by said central portion of the corona wire to



adhere the transfer sheet to the photoconductor in its central portion before the adherence of the transfer sheet to the photoconductor in its remaining portions so that any air between the transfer sheet and the photoconductor is urged outwardly from between the transfer sheet and photoconductor.

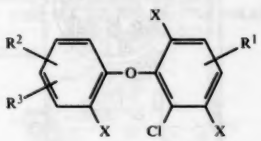
4,203,145

CHLORO-DIPHENYL

Alfons Klein, Duesseldorf; Ernst Knust; Rudolf Kron, both of Leverkusen, and Karlfried Wedemeyer, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 6, 1978, Ser. No. 867,543
Claims priority, application Fed. Rep. of Germany, Jan. 29, 1977, 2703745
Int. Cl.[2] H01B *3/24*
U.S. Cl. 361—317 **29 Claims**

1. In an electrical device containing a dielectric liquid, the improvement wherein said dielectric liquid is a compound of the formula



wherein

X=Cl or H;

R^1 and R^3 are independently C_{1-6} alkyl or C_{5-7} cycloalkyl or hydrogen; and

R^2 is C_{1-6} alkyl or C_{5-7} cycloalkyl.

4,203,146

MULTIPLE METERING PANELBOARD ASSEMBLY

Robert J. Sabatella; Andre J. M'Sadoques, both of Southington, and Joseph F. Rich, New Britain, all of Conn., assignors to General Electric Company, New York, N.Y.

Filed Dec. 18, 1978, Ser. No. 970,411
Int. Cl.[2] H02B *9/00*
U.S. Cl. 361—361 **7 Claims**

1. A multiple metering panelboard assembly comprising, in combination:

A. an enclosure having opposed sidewalls;

B. a barrier wall mounted within said enclosure, said barrier wall defining with one enclosure sidewall a vertically elongated busbar channel and defining with the other enclosure sidewall a wiring trough:

C. a plurality of vertical busbars positioned in said busbar channel; and

D. a vertical array of individual meter sections, each said section including

(1) a molded meter socket base mounted with said enclosure in overlying relation with said busbar channel,

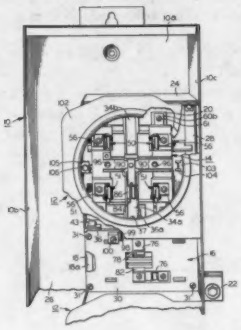
(2) a plurality of first cavities formed in the front surface of said meter socket base,

(3) a plurality of second cavities formed in the rear surface of said meter socket base, each said second cavity intersecting a respective one of said first cavities, said intersecting first and second cavities being in open communication with each other, the bottom surface of each said second cavity being disposed forwardly of the bottom surface of its intersecting first cavity,

(4) a line side jaw positioned in at least one of said first cavities,

(5) a rigid, electrically conductive line strap having a laterally turned forward end portion disposed in the one of said second cavities intersecting said one first cavity and a laterally turned rearward end portion disposed in overlapping relation with one of said busbars,

(6) first electrical joint effecting means including a first bolt threadingly engaging said one busbar to clamp said line strap rearward end portion in electrical connection with said one busbar, a second bolt threadingly engaging said line strap forward end portion to project its threaded shank forwardly into said one first cavity, and a nut threaded on said shank to clamp said line side jaw in electrical connection with said line strap forward end portion,



(7) a molded circuit breaker base mounted in said enclosure in overlying relation with said busbar channel,

(8) at least one stab terminal connector positioned in an open bottom cavity in said circuit breaker base,

(9) a connector strap supported behind said circuit breaker base, said connector strap extending from a first termination clamped in electrical connection with said stab connector toward said meter socket base to a second termination exposed beyond said circuit breaker base,

(10) a load side jaw positioned in at least one other of said meter socket base first cavities,

(11) a rigid electrically conductive load strap having a laterally turned forward end portion disposed in the one of said second cavities intersecting said other first cavity and a laterally turned rearward end portion in disposed overlapping relation with said second termination of said connector strap, and

(12) second electrical joint effecting means including a first bolt threadedly engaging said connector strap second termination to clamp said load strap rearward end portion in electrical connection therewith, a second bolt threadedly engaging said load strap forward end portion to project its threaded shank forwardly into said other first cavity, and a nut threaded on said shank to clamp said load side jaw in electrical connection with said load strap forward end portion.

4,203,147

ELECTROSTATIC SHIELDING ASSEMBLY FOR MOUNTING ELECTRIC CIRCUIT BOARDS

Saad Z. M. Gabr, Canterbury, England, assignor to A.R.D. Anstalt, Vaduz, Liechtenstein

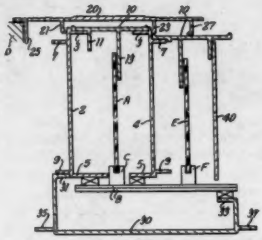
Division of Ser. No. 695,569, Jun. 14, 1976, Pat. No. 4,096,546, which is a continuation of Ser. No. 492,976, Jul. 26, 1974, abandoned. This application Jun. 2, 1978, Ser. No. 911,906

Claims priority, application United Kingdom, Aug. 2, 1973, 36803/73; Aug. 10, 1973, 37961/73; Aug. 24, 1973, 40263/73; Sep. 20, 1973, 44227/73

The portion of the term of this patent subsequent to Jun. 20, 1995, has been disclaimed.

Int. Cl.[2] H05K 7/20

U.S. Cl. 361—386 **4 Claims**



1. An electrostatic shielding assembly for mounting electric circuit boards, comprising a pair of spaced parallel vertical metal plates (2, 4 in FIG. 2; 60, 70 in FIG. 5), a horizontal bottom metal plate (30 in FIG. 2; 80 in FIG. 5) in good electrical contact with at least one of said vertical plates, a horizontal circuit board (B in FIG. 2; 78 in FIG. 5) supported by said assembly and spaced from said bottom plate, and a second vertical circuit board (A in FIG. 2; 68 in FIG. 5) spaced between said vertical plates and disposed above said horizontal circuit board, said vertical circuit board and said pair of spaced parallel vertical metal plates defining between them two channels, there being a third channel between said horizontal circuit board and said bottom plate, said bottom plate closing the lower side of said third channel, whereby said vertical and horizontal metal plates provide electrostatic shielding for said vertical circuit board and said horizontal circuit board.

4,203,148

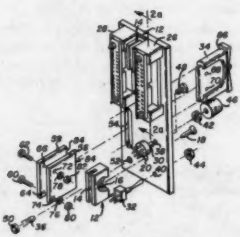
INDICATOR AND CONTROL DEVICE FOR PC BOARDS

Ralph J. McComas, P.O. Box 113, Boulder Creek, Calif. 95006

Filed Apr. 10, 1978, Ser. No. 894,714

Int. Cl.[2] H02B 1/02

U.S. Cl. 361—399 **6 Claims**



1. An indicator and control device for PC boards and the like comprising:

an elongated generally rectangular component mounting plate having a front surface a rear surface and a longitudi-

nal axis, said plate being provided with at least one elongated aperture lying parallel to and laterally offset from said longitudinal axis, and at least one other aperture;

an elongated indicator means affixed to said rear surface so as to be viewable through said elongated aperture;

a manually operable electrical component mounted within said other aperture;

at least one insulating standoff member disposed along said longitudinal axis and provided with a slot for receiving an edge of said circuit board; and

means attaching said standoff member to the rear surface of said mounting plate,

whereby said indicator and control device is attached to said circuit board by lodging an edge of said circuit board within the slot of said standoff member, and by wiring said electrical component to said circuit board.

4,203,149

SUN VISOR FOR VEHICLES

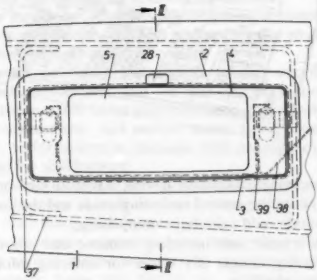
Lothar Viertel, Wuppertal; Gert Mahler, Radevormwald, and Manfred Nowak, Solingen, all of Fed. Rep. of Germany, assignors to Gebr. Happich GmbH, Wuppertal, Fed. Rep. of Germany

Filed May 11, 1978, Ser. No. 904,760

Claims priority, application Fed. Rep. of Germany, Jun. 4, 1977, 2725430

Int. Cl.[2] **B60J** *3/02*

U.S. Cl. 362—144 **36 Claims**



1. A sun visor for vehicles, or the like, comprising:

a sun visor body; a mirror;

frame means for holding said mirror to the exterior of said visor body whereby said mirror is always exposed at the exterior of said visor body and for enabling said mirror to be flipped into and out of said visor body;

said frame means comprising an outer frame in said visor body and comprising an inner frame which is flippably mounted in said outer frame, such that said inner frame may be flipped partially out of said outer frame; said mirror being supported on and flippable with said inner frame;

an electric contact in said outer frame; a cooperating electric contact on said inner frame and placed such that with said inner frame flipped into said outer frame, said electric contacts are disengaged and with said inner frame flipped out of said outer frame, said electric contacts are in engagement;

a light source attached to and movable with said inner frame and connected to said inner frame electric contact for being energized by said contacts being in engagement said inner frame has a chamber therein in which said light source is located; said inner frame chamber having a ventilating hole communicating into said inner frame chamber, wherein said ventilating hole is so placed on said inner frame that when said inner frame is flipped into said outer frame, said ventilating hole is covered and when said inner frame is flipped out of said outer frame, said ventilating hole is uncovered.

4,203,150

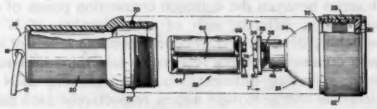
RECHARGEABLE MODULAR COMPONENT LIGHT WITH QUICK-DISCONNECT CONNECTION

Ralph B. Shamlian, 3549 Haven Ave. #E, Menlo Park, Calif. 94025

Filed Oct. 18, 1977, Ser. No. 843,288

Int. Cl.[2] **F21C** *9/00*

U.S. Cl. 362—183 **9 Claims**



1. A flashlight comprising: battery means; casing means for housing said battery means; a lens cap engageable with said casing means; a light; assembly means for mounting said light; means for directly structurally and electrically interconnecting said battery means and said light assembly means together as a unitary assembly comprising a first pair of quick-disconnect electrical contact means on said battery means and a second, mating pair of quick-disconnect electrical contact means on said light assembly means, whereby said light assembly means and said battery means may also be readily disassembled for recharging or replacement of said battery means.

4,203,151

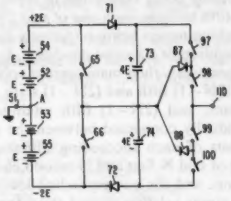
HIGH-VOLTAGE CONVERTER CIRCUIT

Richard H. Baker, Bedford, Mass., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Sep. 21, 1978, Ser. No. 944,634

Int. Cl.[2] **H02M** *7/537*

U.S. Cl. 363—43 **13 Claims**



1. An inverter circuit for converting DC voltages in a range between +NE volts into an AC voltage having a multitier waveform, where N is any integer number 1, 2, 3, 4, 5 . . . , comprising:

first and second terminals for receiving first and second operation voltages, respectively;

third, fourth and fifth terminals;

an output terminal;

a reference voltage terminal for connection to a point of reference potential;

a plurality of N first and N second switching means each having a main current conduction path, each being selectively operable to one of a first condition or a second condition, for opening and closing, respectively, their main current conduction path, the main current conduction path of said N first switching means being connected in series between said first and fourth terminals, the main current conduction paths of said N first and N second switching means being connected in series between said

first and fourth, and second and fourth terminals, respectively;

a plurality of N first and N second electrical charge storage means connected in series between said third and fourth, and fourth and fifth terminals, respectively;

first unidirectional current means connected between and polarized for passing current from said first to said third terminals;

second unidirectional current means connected between and polarized for passing current from said fifth to said second terminals;

a plurality of (N−1) pairs of third and (N−1) pairs of fourth unidirectional current means, said (N−1) pairs of third unidirectional current means being connected individually in series between the common connection points of each succeeding different two of said plurality of N first switching devices, and the corresponding levels of common connection points relative to said third terminal of each succeeding different two of said plurality of N first electrical charge storage means, respectively, each pair of third unidirectional current means being polarized for permitting current to flow from their own common connection point to their associative common connection points of said N first switching means and said N first charge storage means, respectively, said (N−1) pairs of fourth unidirectional current means each being connected individually in series between the common connection points of each succeeding different two of said plurality of N second switching devices, and the corresponding levels of common connection points relative to said fourth terminal of said plurality of N second electrical charge storage means, respectively, each pair of fourth unidirectional current means being polarized for conducting current from their own common connection point to their associative common connection points of said N second switching means and said N second charge storage means, respectively;

a plurality of 2N third and 2N fourth switching means each having a main current conduction path, the main current conduction paths of said 2N third switching means being connected in series between said third and output terminals, the main current conduction paths of said 2N fourth switching means being connected in series between said output and fifth terinals, each one of said 2N third and 2N fourth switching means being selectively operable to one of a first condition or a second condition, for opening and closing, respectively, their main current conduction paths;

a plurality of (2N−1) fifth and (2N−1) sixth unidirectional current means, said (2N−1) fifth unidirectional means being individually connected between the common connection points of each succeeding different two of the series string of said N first and N second electrical charge storage means, and the corresponding levels of common connection points relative to said third terminal of each succeeding different two of said plurality of 2N third switching means, said (2N−1) fifth unidirectional means each being polarized for conducting current from the associative connection point in said string of N first and N second electrical charge storage means to their associative point in said series string of 2N third switching means, said (2N−1)sixth unidirectional means each being polarized for conducting current from their associative connection point in said string of 2N fourth switching means to their associative connection point in said string of said N first and N second electrical charge storage means;

DC voltage supply means connected between said first and second terminals, for supplying +2NE volts and −2NE volts to these terminals, respectively, and for individually applying progressively less positive fixed levels of voltage to the midpoints of each one of said (N−1) pairs of third unidirectional current means relative to said first terminal, the midpoints of said (N−1) pairs of fourth unidirectional current means relative to said fourth terminal being connected individually to like positioned midpoints of said (N−1) pairs of third unidirectional current means relative to said first terminal, said DC voltage supply means having a common point connected to said reference voltage terminal;

said pluralities of N first, N second, 2N third and 2N fourth switching means being operable to various combinations of their first and second conditions for producing substantially any practical AC voltage having a multitiered waveform with a peak-to-peak amplitude of up to +NE volts, and a predetermined frequency.

4,203,152

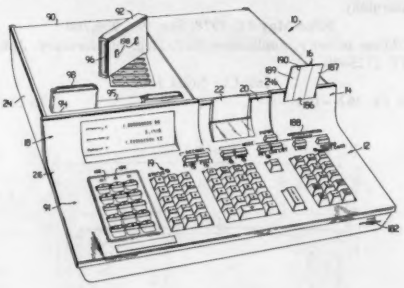
PROGRAMMABLE CALCULATOR INCLUDING KEY-LOG PRINTING MEANS

Robert E. Watson; Jack M. Walden, and Charles W. Near, all of Loveland, Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Division of Ser. No. 535,750, Dec. 23, 1974, which is a division of Ser. No. 153,437, Jun. 15, 1971, Pat. No. 3,859,635. This application Nov. 10, 1977, Ser. No. 850,332

Int. Cl.[2] **G06F** *3/12, 3/02*

U.S. Cl. 364—200 **13 Claims**



1. An electronic calculator having a plurality of operating modes including the manual operating mode and the automatic operating mode, said calculator comprising:

a keyboard input unit including numeric and non-numeric keys having unique key codes for entering information into the calculator;

a first memory unit into which information may be written and from which information may be read;

a second memory unit for storing routines and subroutines to be executed by the calculator in performing selected functions;

processing means responsive to information from the keyboard input unit or the first memory unit and to operating modes of the calculator for selectively executing one or more of the routines and subroutines stored in the second memory unit to perform selected functions employing information from the keyboard input and first memory units;

an output printer unit coupled to the processing means for providing an output indication of the functions performed by the calculator; and

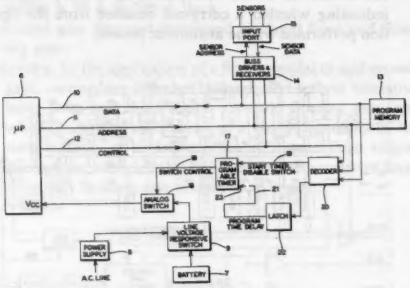
control means coupled to the processing means and the output printer unit for causing the key code of the numeric and several of the non-numeric keys actuated to be printed by the output printer unit in response to actuation of a first non-numeric key in the manual operating mode;

said control means including logic means coupled to the processing means and output printer unit for causing the key code and mnemonic representation of each program step of programs stored in the first memory unit to be printed by the output printer unit in response to the actuation of a second non-numeric key in the automatic operating mode.

4,203,153
CIRCUIT FOR REDUCING POWER CONSUMPTION IN BATTERY OPERATED MICROPROCESSOR BASED SYSTEMS

James C. Boyd, Canton, Ohio, assignor to Diebold, Incorporated, Canton, Ohio

Filed Apr. 12, 1978, Ser. No. 895,771
Int. Cl.[2] G06F 3/00
U.S. Cl. 364—200 8 Claims



1. A circuit for conserving battery power in a battery operated, microprocessor based system, comprising:

a microprocessor having an internal clock;

a battery for energizing said microprocessor;

switch means for selectively establishing a connection between said battery and said microprocessor to energize or deenergize said microprocessor;

means for providing instructions to said microprocessor which periodically call for task performances by said microprocessor to be executed upon energization of said microprocessor, said switch means being closed during task performances to maintain said microprocessor energized by said battery;

timer means continuously energized independently of said switch means as well as of said microprocessor and clock for controlling said switch means,

said timer means operative, upon being triggered, to open said switch means and thereby disconnect said microprocessor from said battery for a predetermined time duration and then reclose said switch means after the predetermined time duration to reconnect said microprocessor with said battery and thereby enable said microprocessor for another task performance; and

means responsive to an output of said microprocessor for triggering said timer means upon completion of each task performance.

4,203,154
ELECTRONIC IMAGE PROCESSING SYSTEM

Butler W. Lampson, Portola Valley, Calif.; Robert F. Sproull, Pittsburgh, Pa.; Severo M. Ornstein, Portola Valley, and James Y. Leung, Torrance, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 24, 1978, Ser. No. 899,751
Int. Cl.[2] G06F 3/14, 13/00
U.S. Cl. 364—200 9 Claims

1. An electronic image processing system for converting character font data into image data utilizable by a raster output scanning device capable of formatting said image data in a plurality of scan lines onto an imaging medium, comprising:

a main memory having character font data stored therein;

an input memory for receiving character font data from said main memory;

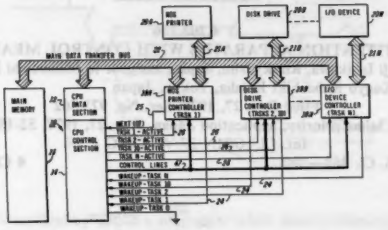
a data pattern memory responsive to a predetermined address signal for providing a predetermined pattern of data defining a desired grey-scale tone for said image data;

a band buffer memory capable of storing image data representing a predetermined number of scan lines constituting an image band, said band buffer memory having enable input lines and associated data input lines;

means coupled to said input memory for addressing said input memory to access character font data therefrom;

means coupled to said band buffer memory for applying character font data accessed from said input memory to respective enable input lines of said band buffer memory;

means coupled to said data pattern memory for applying said predetermined address signal to said data pattern memory;



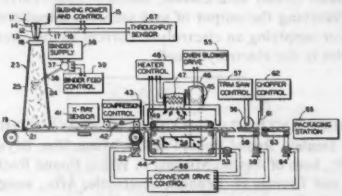
means coupled to said band buffer memory for applying said predetermined pattern of data accessed from said data pattern memory to respective data input lines of said band buffer memory; and

means for addressing said band buffer memory to load into an addressed memory location said predetermined pattern of data only with respect to those data input lines whose associated enable input lines are enabled by said character font data.

4,203,155
APPARATUS AND METHOD FOR CHANGING PRODUCTS ON A CONTINUOUS FIBROUS GLASS PRODUCTION LINE

John M. Garst, Granville, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation of Ser. No. 798,510, May 19, 1977, abandoned.
This application Jul. 20, 1978, Ser. No. 926,591
Int. Cl.[2] G06F 15/46; C03B 37/02
U.S. Cl. 364—473 10 Claims



1. A system for controlling the production of each one of a plurality of continuous fibrous glass products, comprising:

a source of fibrous glass for the continuous products;

means for processing said fibrous glass into the continuous products in response to a plurality of control signals, said processing means including at least a first and a second processing station spaced apart along the path of travel of the continuous products;

means for defining the advance of a sacrificial production increment through each of said first and second processing stations, said sacrificial production increment including lost production of the continuous products;

control means for generating said control signals in response

to a plurality of setpoint signals representing processing variables;

means for generating a product change request signal; and

means for generating said setpoint signals, said signal generating means being responsive to said advance defining means and said product change request signal for changing the value of at least one of said setpoint signals associated with each of said first and second processing stations during the times that said sacrificial production increment is being processed by said first and second processing stations respectively.

4,203,156

TITRATION APPARATUS WITH CONTROL MEANS

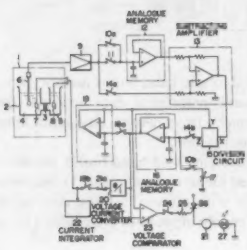
Seiji Ishikawa, Kitakyushu, Japan, assignor to Mitsubishi Kasei Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 27, 1978, Ser. No. 973,562

Claims priority, application Japan, Dec. 27, 1977, 52-156397

Int. Cl.[2] G01N *27/44*; G06G *7/18*

U.S. Cl. 364—500 **4 Claims**



1. A titration controlling apparatus comprising an electrolytic cell including a pair of electrolytic electrodes and a detecting electrode; first analogue memory device for temporarily storing an electric signal obtained from the detecting electrode; a subtractor for subtracting said stored electric signal from an electric signal immediately following said electric signal; a division circuit receiving the output of the subtractor as a dividend; a second analogue memory device for temporarily storing the output of the division circuit; a third analogue memory device for temporarily storing the output of the second analogue memory device and for delivering an output to the division circuit as a divisor; and a voltage/current converter receiving the output of said second analogue memory device for supplying an electrolytic current to the electrolytic electrodes in the electrolytic cell.

4,203,157

CARRY ANTICIPATOR CIRCUIT AND METHOD

R. Gary Daniels, Round Rock; Fuad H. Musa; Wm. Bryant Wilder, Jr., both of Austin; Michael F. Wiles, Round Rock, all of Tex., and Thomas H. Bennett, Scottsdale, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 5, 1978, Ser. No. 939,724

Int. Cl.[2] G06F *7/50*

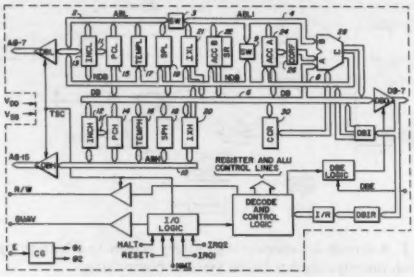
U.S. Cl. 364—788 **11 Claims**

1. A carry anticipator circuit suitable for use within a data processor for reducing the time required to perform arithmetic operations, comprising:

(a) first means for providing a first digital signal having a first predetermined number of bits;

(b) second means for providing a second digital signal having a second predetermined number of bits, the second predetermined number being greater than the first predetermined number, the second digital signal being provided as a most significant group and a least significant group of bits, the least significant group having the first predetermined number of bits, and the most significant group of bits corresponding to a first binary value;

(c) arithmetic means having first input means coupled to the first means for receiving the first digital signal and second input means coupled to the second means for receiving the least significant group of bits, the arithmetic means performing an arithmetic operation upon the bits received by the first and second input means to provide a least significant result having the first predetermined number of bits, the arithmetic means also providing a carry signal for indicating whether a carry-out resulted from the operation performed by the arithmetic means;



(d) third means coupled to the second means for receiving the most significant group of bits and for providing an incremented group of bits, the incremented group of bits corresponding to a second binary value which is one larger than the first binary value; and

(e) fourth means coupled to the third means for receiving the incremented group of bits and coupled to the second means for receiving the most significant group of bits, the fourth means being responsive to the carry signal for selecting either the most significant group of bits or the incremented group of bits and providing the selected bits as a most significant result.

4,203,158

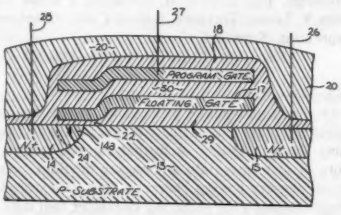
ELECTRICALLY PROGRAMMABLE AND ERASABLE MOS FLOATING GATE MEMORY DEVICE EMPLOYING TUNNELING AND METHOD OF FABRICATING SAME

Dov Frohman-Bentchkowsky, Haifa, Israel; Jerry Mar, Sunnyvale, Calif.; George Perlegos, Cupertino, Calif., and William S. Johnson, Palo Alto, Calif., assignors to Intel Corporation, Santa Clara, Calif.

Continuation-in-part of Ser. No. 881,029, Feb. 24, 1978, abandoned. This application Dec. 15, 1978, Ser. No. 969,819

Int. Cl.[2] G11C *11/40*

U.S. Cl. 365—185 **16 Claims**



1. An electrically programmable and electrically erasable MOS memory device comprising:

a substrate of a first conductivity type;

first and second spaced-apart regions in said substrate of a second conductivity type;

an electrically floating, conductive gate disposed generally between said spaced-apart first and second regions;

a first insulative layer insulating said floating gate from said substrate;

a thin region in said substrate of said second conductivity type;

said floating gate extending over said third region and insultated from said third region by a second insulative layer which is 70 Å to 200 Å thick;

a second gate disposed above and insulated from said floating gate;

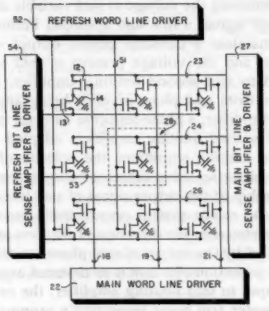
whereby, by the application of a first potential to said second gate, carriers are tunneled through said second insulative layer from said third region into said floating gate, and whereby, by the application of a second potential of the same polarity as said first potential to said third reigon, carriers are tunneled through said second insulative layer from said floating gate to said third region.

4,203,159

PSEUDOSTATIC ELECTRONIC MEMORY

Frank M. Wanlass, 21498 Meteor Dr., Cupertino, Calif. 95014

Filed Oct. 5, 1978, Ser. No. 948,683
Int. Cl.[2] G11C *7/00, 11/24*
U.S. Cl. 365—222 **5 Claims**


REFRESH WORD LINE DRIVER
REFRESH BIT LINE SENSE AMPLIFIER & DRIVER
MAIN BIT LINE SENSE AMPLIFIER & DRIVER
MAIN WORD LINE DRIVER

1. A pseudostatic electronic memory comprising:

A. an array of capacitative memory cells, each one of which is adapted to hold any one of a plurality of different amounts of electrical charge representative of information to be stored and includes;

(1) a first electronic switch for controlling the application and sensing of charge on said cell;

(2) a single second electronic switch for controlling periodic detection and refreshing of the charge on said cell;

B. means both to apply electrical charge to said cells and to sense the amount of charge thereon at any given time;

C. means independent of said charge application and sensing means to detect and refresh periodically the amount of charge on each of said cells;

D. the operation of said first electronic switch being controlled by the voltage state present on a word line of said array, and the charge on said cell being sensed and applied thereto through a bit line of said array; and

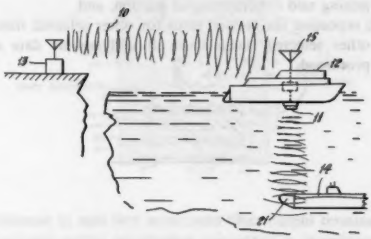
E. the operation of said second electronic switch being controlled by the voltage state present on a second word line of said array, and the charge on said cell being detected and refreshed periodically through a second bit line of said array.

4,203,160

SUBMARINE COMMUNICATION

John J. Doherty, Fairfax, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 30, 1960, Ser. No. 79,931
Int. Cl.[2] H04B *1/59*
U.S. Cl. 367—2 **3 Claims**



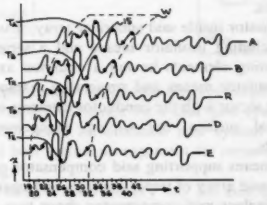
2. A method by which a submarine while deeply submerged in the sea may receive a message from a remote station without disclosing to others the position of the submarine, which comprises transmitting from said remote station into the atmosphere message information modulated on electromagnetic radiant energy, intercepting said radiant energy at a plurality of separated and widely dispersed relay stations on the surface of the sea, extracting the message information from the electromagnetic energy and transmitting acoustic wave energy modulated by said message information from each of said relay stations into the sea, locating said submerged submarine in message receiving range of one of said relay stations and detecting the acoustic wave energy modulated by the message information aboard said submarine.

4,203,161

METHOD OF ENHANCING COMMON DEPTH POINT SEISMIC DATA

Jay P. Johnson, Houston; Alvin L. Parrack, Bellaire, and Delbert R. Lunsford, Houston, all of Tex., assignors to Texaco Inc., White Plains, N.J.

Continuation-in-part of Ser. No. 230,810, Mar. 1, 1972. This application Nov. 10, 1972, Ser. No. 305,386
Int. Cl.[2] G01V *1/36*
U.S. Cl. 367—40 **17 Claims**



1. A method for enhancing digital seismic data said data having a coherent signal component comprising a measure of similarity between spatially related time series data, and a noise component in unmoved out form, comprising the steps of:

(a) determining for a selected time T_R on a selected seismic trace R, the estimated times T_X on one or more additional traces included in the data at which possible events common to a possible event at T_R occur;

(b) determining, for a search window having edges equally

spaced on either side of times T_R the coherent signal component;

(c) computing, by use of said coherent signal component, the component of said coherent signal extant in said selected trace T_R and replacing in time alignment with said selected trace on an output signal record medium, that portion of said selected trace T_R included in said search window with said component of the selected trace comprising said coherent signal portion; and

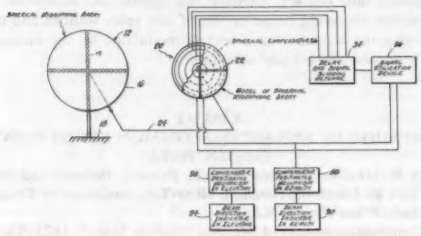
(d) repeating the recited steps for other selected times and other selected traces until all said seismic data are so processed.

4,203,162

ELECTRICALLY STEERABLE SPHERICAL HYDROPHONE ARRAY

Walter L. Clearwaters, Quaker Hill; Lloyd T. Einstein, New London; Paul F. Radics, Jr., Oakdale, and John W. Soderberg, Niantic, all of Conn., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 10, 1964, Ser. No. 360,181
Int. Cl.[2] G01S *3/80*
U.S. Cl. 367—122 **2 Claims**



1. Beam forming apparatus for a spherical array of hydrophones comprising:

a spherical array of radially inwardly directed wiper contacts,

a compensator inside said spherical array of wiper contacts and including insulator means and a series of circular conducting elements having a common axis secured in said insulator means and presenting a smooth spherical surface sector with the conductor elements exposed at the spherical surface, for wiping engagement with the contacts,

training means supporting said compensator concentrically within said array of wiper contacts and operable to arcuately displace said compensator about two axes through the center of said array of contacts,

signal delay means and signal summing means carried by said training means inside said array of contacts and coupled to the conducting elements for delaying signals from the progressively smaller conductors by progressively longer time periods and for summing the variously delayed signals, and

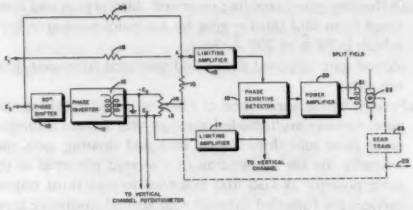
cooperating brush and slip ring means carried by said training means and said array of wiper contacts for delivering the output of said summing means.

4,203,163

TARGET-DETECTION AND LOCATION SYSTEM

Carroll L. Key, Jr., State College, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 25, 1959, Ser. No. 855,479
Int. Cl.[2] G01S *3/80*
U.S. Cl. 367—125 **12 Claims**



6. In a target-detection and location system adaptable for the navigation of an acoustic torpedo, having a first and a second alternating voltage signal emanating from the acoustic detection portion of said torpedo the combination comprising: a phase-shifter adapted to delay the phase of said incoming first voltage signal 90 degrees; a phase-inverter driven by said phase-shifter the output of said phase-inverter being two voltages, one in-phase with and the other out-of-phase with the signal from said phase-shifter; a potentiometer having a variable arm electrically connected therewith, said potentiometer being connected across the output of said phase-inverter; means for combining the voltage at said variable arm with said second voltage signal; a first and a second limiting amplifier adapted to maintain a constant power output, said second voltage signal and the voltage present at said variable arm being applied to said second limiting amplifier, and said in-phase voltage from said phase-inverter being applied to said first limiting amplifier; a phase-sensitive detector connected to said first and second limiting amplifiers adapted to compare signals of said limiting amplifiers, the polarity of the output signal of said phase-sensitive detector being dependent on the phase-relationship of the output signal of said limiting amplifiers; and a servo motor system operationally associated with said potentiometer arm, the direction of rotation of said motor being controlled by the output of said phase-sensitive detector whereby said potentiometer arm is so oriented as to result in a zero signal input to said limiting amplifier, the orientation of said potentiometer arm being respectively proportional to the magnitude of said second voltage and indicative of its polarity.

4,203,164

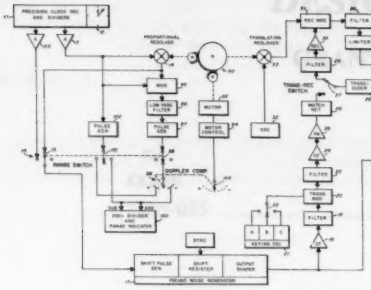
SECURE SONAR COMMUNICATION SYSTEM

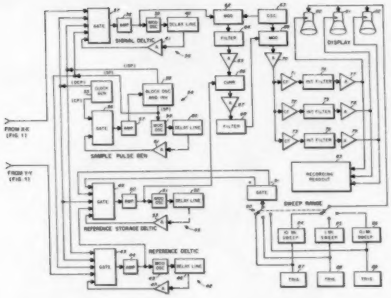
Robert D. Isaak; William E. Klund; Woodrow H. Littrell, all of San Diego, and Richard G. Stephenson, Rolling Hills, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 6, 1961, Ser. No. 93,811
Int. Cl.[2] H04B *11/00*
U.S. Cl. 367—134 **11 Claims**

1. A secure sonar communication system for transmitting and receiving intelligence signals within an aqueous medium comprising in combination means for generating an electrical pseudo random noise signal within a predetermined bandwidth, means connected to said pseudo random noise generating means for selectively driving same at one of a plurality of predetermined frequencies, keying oscillator means adapted to selectively produce an output of one of a plurality of predetermined frequency signals, a balanced modulator means coupled to said pseudo random noise signal generating means and said keying oscillator means for mixing the output signals therefrom, bandpass filter means connected to the output of said balanced modulator means for passing the upper sideband

thereof, means for receiving an electrical pseudo random noise signal, transducer means, said transducer means being capable of broadcasting acoustical energy upon excitation by the upper sideband from the aforesaid bandpass filter means and in proportion thereto and for producing an electrical pseudo random





noise output signal in proportion to a received acoustical pseudo random noise signal, and means connected to the output of said bandpass filter means and the input of said electrical pseudo random noise signal receiving means for selectively connecting same to said transducer means during broadcasting and receiving operations respectively.

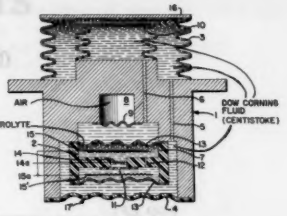
4,203,165

ACOUSTIC FILTER

Herbert V. Hillery, Austin, Tex., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 24, 1956, Ser. No. 618,160
Int. Cl.[2] H04R 1/44
U.S. Cl. 367—135 **6 Claims**

1. A hydroacoustic filter and detecting device of the character described comprising an electrolytic detector cell having an acoustical resistance and an inertance in series therewith and an asymmetrical acoustical filter network, said filter network including means providing a pair of input acoustical capacitances with one each thereof disposed in each of the two sides of the filter to be subjected to a signal input, means including straight tube for providing acoustical resistance and inertance in output shunting relation to said input capacitances, acoustical capacitance means and a straight tube acoustical resistance inertance means connected in series in one side of said filter and following said shunting resistance and inertance, a acoustical capacitance means in the other side of the filter and connected in an acoustical shunting relation between said input shunting straight tube connection and the output termination of said series connected capacitance and resistance-inertance to provide one output terminal of said filter, said electrolytic detector cell being connected in shunting relation to said last named acoustical capacitance means with one output termination common to said first mentioned filter output termination and a second output termination connected in impedance dividing relation between the acoustical capacitance provided by said detector cell and the series inertance and acoustical resistance thereof.

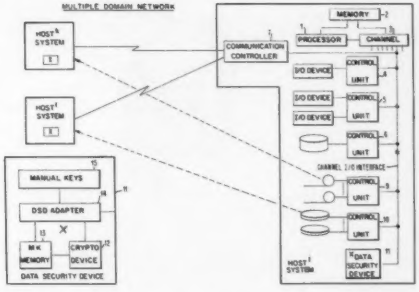


4,203,166

CRYPTOGRAPHIC FILE SECURITY FOR MULTIPLE DOMAIN NETWORKS

William F. Ehrsam, Kingston; Robert C. Elander, Saugerties; Stephen M. Matyas, Poughkeepsie; Carl H. W. Meyer, Kingston; Richard J. Sahulka, and Walter L. Tuchman, both of Woodstock, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 5, 1977, Ser. No. 857,535
Int. Cl.[2] H04L 9/00
U.S. Cl. 375—2 **43 Claims**



1. In a multiple domain data processing system providing file security for a data file created by a first host system in one domain and recovered by a second host system in another domain, a first host system arrangement for creating said data file comprising:

means providing a file recovery key for said data file for subsequent recovery at said second host system representing a primary file key enciphered under a file cross domain key for cross domain file communication between said first and second host systems,

means providing first host system plaintext, and

means performing a cryptographic operation to encipher said first host system plaintext under said primary file key to obtain first host system ciphertext for said data file.

DESIGN PATENTS

GRANTED MAY 13, 1980

ERRATA

For CLASS	See PATENT NO.
D26–035	254,995

DESIGN PATENTS

GRANTED MAY 13, 1980

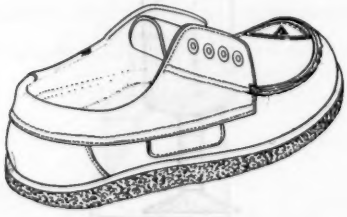
ERRATA

For	Read
CLASS	PATENT NO.
D24-02G	254,995

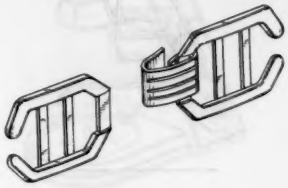
254,936
FROZEN POTATO PATTY
Francis R. Saunders, Lake Oswego, Oreg., assignor to Amfac Foods, Inc., Portland, Oreg.
Filed Nov. 15, 1976, Ser. No. 741,870
Term of patent 14 years
Int. Cl. D1—*01*
U.S. Cl. D1—1

254,937
BRASSIERE
Phyllis Raimondi, Glen Rock, N.J., assignor to International Playtex, Inc., Stamford, Conn.
Filed Jun. 17, 1977, Ser. No. 807,605
Term of patent 14 years
Int. Cl. D2—*01*
U.S. Cl. D2—24

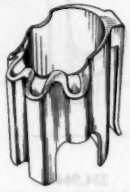
254,938
SHOE
Joergen Keller, Vordingborg, Denmark, assignor to A/S JAC. Engelbredt, Vordingborg, Denmark
Filed Sep. 16, 1977, Ser. No. 834,150
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—268



254,939
BELT BUCKLE
Otto Lober, Pforzheim, Fed. Rep. of Germany, assignor to Gutos Metallschliessenfabrik Bader & Hoch AG, Pforzheim, Fed. Rep. of Germany
Filed Apr. 8, 1977, Ser. No. 786,017
Term of patent 3½ years
Int. Cl. D02—*99*
U.S. Cl. D2—418



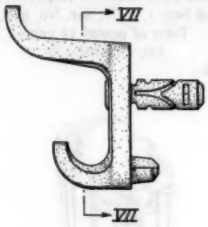
254,940
GOLF BALL AND TEE CADDY
Thomas A. Thomas, 1911 Harrison St., Hollywood, Fla. 33020
Filed Sep. 1, 1977, Ser. No. 829,973
Term of patent 14 years
Int. Cl. D02—*99*
U.S. Cl. D2—400



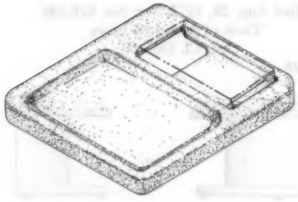
254,941
UPHOLSTERED STOOL OR THE LIKE
Gregory L. Simmons, 7863 Denham Rd. E., Jacksonville, Fla. 32208
Filed Aug. 29, 1977, Ser. No. 828,558
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—26

254,942
GLIDER CHAIR
Albert E. Browning, Rte. 4, Box 425, Winnsboro, La. 71295
Filed Feb. 13, 1978, Ser. No. 877,363
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—54

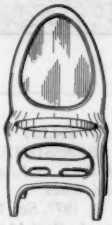
254,943
HOOK FOR A HOLLOW DOOR
Paul S. Hepworth, Leicester, England, assignor to Plas Plugs Ltd., Staffordshire, England
Filed Apr. 11, 1978, Ser. No. 895,307
Claims priority, application United Kingdom, Oct. 27, 1977, 982064/77; Dec. 21, 1977, 982687/77
Term of patent 14 years
Int. Cl. D6—*06;* D8—*08*
U.S. Cl. D6—122



254,944
COMBINED CHANGE TRAY AND PORTABLE CALCULATOR SUPPORT
Thomas M. Lee, 15 A Redhill Cir., Tiburon, Calif. 94920, and Richard A. Seifert, 5631 Firestone Rd., Livermore, Calif. 94550
Filed Oct. 27, 1977, Ser. No. 846,270
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—181

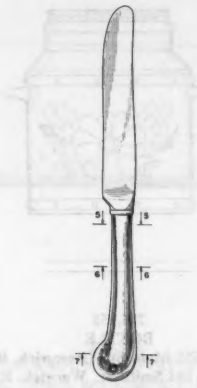


254,945
CHAIR FRAME
James Worrell, 1854 Gail La., Anaheim, Calif. 92802
Filed Feb. 9, 1978, Ser. No. 876,425
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—191

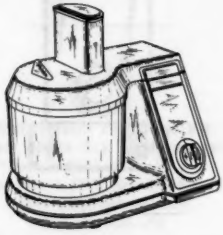


254,946
GOBLET
Ramin Tayebi, 31252 Ceanothus, South Laguna, Calif. 92677
Filed Jul. 10, 1978, Ser. No. 923,029
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—13

254,947
KNIFE OR SIMILAR ARTICLE OF FLATWARE
William J. Knope, Meriden, Conn., assignor to International Silver Company, Meriden, Conn.
Filed Oct. 3, 1977, Ser. No. 838,931
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—150



254,948
KITCHEN-MACHINE
John Besford, Son, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Apr. 27, 1977, Ser. No. 791,503
Claims priority, application Benelux, Oct. 29, 1976, 765141903
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—153



254,949
KITCHEN-MACHINE
John Besford, Son, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Apr. 27, 1977, Ser. No. 791,504
Claims priority, application Benelux, Oct. 29, 1976, 7651419-02
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—153

254,950
KITCHEN-MACHINE
John Besford, Son, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Apr. 27, 1977, Ser. No. 791,505
Claims priority, application Benelux, Oct. 29, 1976, 7651419-01
Term of patent 14 years
Int. Cl. D07—*04*
U.S. Cl. D7—153

254,951
COMPOST BIN
Laurence R. Gedye, Doncaster East, Australia, assignor to L. R. & N. R. Gedye Pty. Limited, Doncaster East, Australia
Filed Oct. 31, 1977, Ser. No. 846,997
Term of patent 14 years
Int. Cl. D7—*07, 01*
U.S. Cl. D7—192

254,952
SHEARS
William J. Hildebrandt, West Simsbury, and Richard H. Rathbun, Oakdale, both of Conn., assignors to The Stanley Works, New Britain, Conn.
Filed Nov. 2, 1977, Ser. No. 848,021
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—5

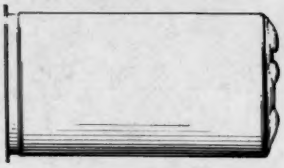
254,953
COMBINED GRILL CLEANER AND CONTAINER OPENER
William B. Delamater, 9114 Valley View, Whittier, Calif. 90603
Filed Mar. 24, 1977, Ser. No. 781,069
Term of patent 14 years
Int. Cl. D07—*99;* D08—*05*
U.S. Cl. D8—18

254,954
JAR OR THE LIKE
J. A. Pinto Ribeiro, Lisbon, Portugal, assignor to Florists' Transworld Delivery Association, Southfield, Mich.
Filed Sep. 20, 1978, Ser. No. 945,172
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—39

254,955
BOTTLE
Philip F. Hartung, 655 Main St., Greenwich, R.I. 02818, and John J. Tramonti, 142 Smith St., Warwick, R.I. 02886
Filed Sep. 22, 1977, Ser. No. 835,767
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—91

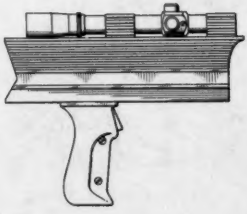
254,956
TRAY FOR PACKAGING CONTAINERS OF YOGURT OR THE LIKE
James E. Gilley, South China, Me., assignor to Keyes Fibre Company, Waterville, Me.
Filed Dec. 19, 1977, Ser. No. 862,166
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—184

254,957
BEVERAGE CONTAINER
Arlin L. Campbell, and Roger B. Cannon, both of Muncie, Ind., assignors to Ball Corporation, Muncie, Ind.
Filed Aug. 17, 1977, Ser. No. 825,464
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—216

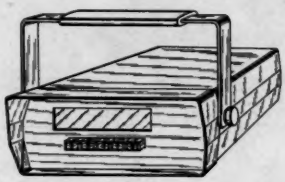


254,958
LID FOR A PACKAGING CONTAINER OR THE LIKE
David R. Dugan, Warsaw, and Kenneth E. Prince, Indianapolis, both of Ind., assignors to Owens-Illinois Inc., Toledo, Ohio
Filed Sep. 29, 1977, Ser. No. 837,953
Term of patent 14 years
Int. Cl. D09—*07*
U.S. Cl. D9—254

254,959
RADIATION PYROMETER
Charles E. Everest, Santa Ana, Calif., assignor to Telatemp Corporation, Fullerton, Calif.
Filed Jan. 3, 1978, Ser. No. 866,533
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—57



254,960
DIGITAL TACHOMETER DESIGN
Patrick J. Helm, Toledo, Ohio, assignor to Kent-Moore Instrument Company, Pioneer, Ohio
Filed Dec. 29, 1977, Ser. No. 865,366
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—98



254,961
WATCHSTRAP
Bronislaw L. Hofman, New York, N.Y., assignor to Genal Strap, Inc., New York, N.Y.
Filed Aug. 15, 1978, Ser. No. 933,750
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—3

254,962
WATCHSTRAP
Bronislaw L. Hofman, New York, N.Y., assignor to Genal Strap, Inc., New York, N.Y.
Filed Aug. 15, 1978, Ser. No. 933,751
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—3

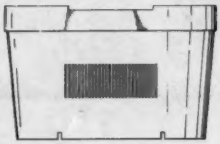
254,963
WATCHSTRAP
Bronislaw L. Hofman, New York, N.Y., assignor to Genal Strap, Inc., New York, N.Y.
Filed Aug. 15, 1978, Ser. No. 933,761
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—3

254,964
WATCHSTRAP
Bronislaw L. Hofman, New York, N.Y., assignor to Genal Strap, Inc., New York, N.Y.
Filed Aug. 15, 1978, Ser. No. 933,768
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—3

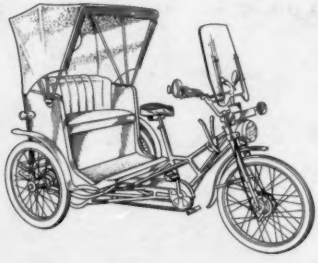
254,965
WATCHSTRAP
Bronislaw L. Hofman, New York, N.Y., assignor to Genal Strap, Inc., New York, N.Y.
Filed Aug. 15, 1978, Ser. No. 933,769
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—3

254,966
PENDANT OR THE LIKE
Terry C. Allison, 607 Foundry Rd., Greenwood, S.C. 29646
Filed Feb. 16, 1977, Ser. No. 769,020
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—61

254,967
FLOWER POT
Michael I. Katz, P.O. Box 1401, Johannesburg 2000, South Africa
Filed Aug. 1, 1978, Ser. No. 930,078
Claims priority, application South Africa, Feb. 6, 1978, 78/0088
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—152



254,968
THREE-WHEELED VEHICLE
George C. Moore; Jodele Moore, both of P.O. Box 1006, Solvang, Calif. 93463, and James M. Tipke, 2823 N. Perry St., Spokane, Wash. 99207
Filed Sep. 15, 1978, Ser. No. 942,666
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—112

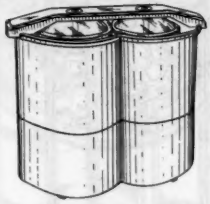


254,969
BABY STROLLER
Shinroku Nakao, Yokohama; Kouichi Kobayashi, and Kazuo Moriya, both of Tokyo, all of Japan, assignors to Combi Co., Ltd., Tokyo, Japan
Filed Feb. 24, 1978, Ser. No. 880,814
Claims priority, application Japan, Aug. 26, 1977, 52-33952
Term of patent 14 years
Int. Cl. D12—*12*
U.S. Cl. D12—129

254,970
WHEELCHAIR
Hiroshi Honzyou, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Mar. 29, 1978, Ser. No. 891,471
Term of patent 14 years
Int. Cl. D12—*12*
U.S. Cl. D12—131

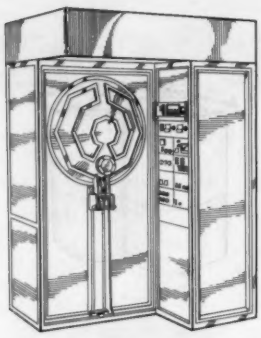
254,971
CANOPY FOR PICK-UP TRUCK BED
Ronald D. Riddle, 9572 Oasis Ave., Garden Grove, Calif. 92644
Filed May 15, 1978, Ser. No. 906,017
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—156

254,972
ICE CREAM MAKER
William J. Rakocy, Nutley, and Masao Tsuji, North Plainfield, both of N.J., assignors to North American Philips Corporation, New York, N.Y.
Filed Dec. 7, 1977, Ser. No. 858,364
Term of patent 14 years
Int. Cl. D15—*07*
U.S. Cl. D15—82

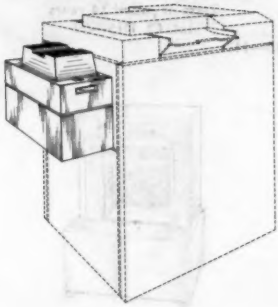


254,973
COLOR MIXING APPARATUS
Börge Ahrenskou-Sörensen, Hägersten, Sweden, assignor to Svenska Skandex Aktiebolag, Stockholm, Sweden
Filed May 5, 1977, Ser. No. 794,124
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D15—147

254,974
VACUUM DEPOSITION APPARATUS
Gunard O. B. Mahl, San Francisco, Calif., assignor to CHA Industries, Menlo Park, Calif.
Filed Apr. 17, 1978, Ser. No. 896,920
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—199

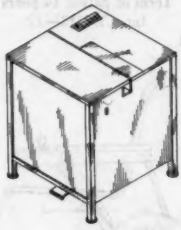


254,975
CONVENIENCE COLLATOR FOR A COPIER
Joseph L. Gambrell, Lexington, Ky.; Gene P. Gilleland, Boulder, Colo.; Allen D. Hawthorne, New Canaan, Conn.; Robert M. Hofland, Boulder, and James A. McCuiston, Longmont, both of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Nov. 17, 1977, Ser. No. 852,412
Term of patent 14 years
Int. Cl. D16—*03;* D14—*02*
U.S. Cl. D16—32

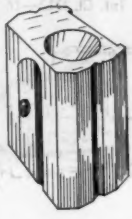


254,976
MUSICAL RHYTHM INSTRUMENT
Michael J. Valente, 116 Harding Ter., Dedham, Mass. 02026
Filed Aug. 15, 1977, Ser. No. 824,445
Term of patent 14 years
Int. Cl. D17—*04*
U.S. Cl. D17—22

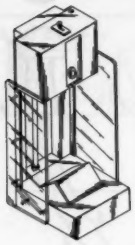
254,977
COMBINED POWER STAPLER AND DESK STAPLER UNIT
George F. Villwock, and Conrad R. Medina, both of Rolling Meadows, Ill., assignors to Swingline, Inc., Long Island City, N.Y.
Filed Dec. 20, 1976, Ser. No. 752,813
Term of patent 14 years
Int. Cl. D18—*04*
U.S. Cl. D18—34



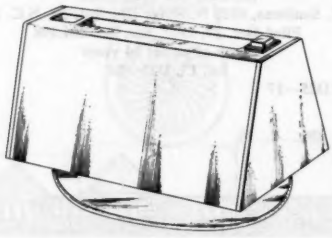
254,978
PENCIL SHARPENER
Werner Mobius, Hindenburgstrasse 77, Erlangen, Fed. Rep. of Germany
Filed Feb. 23, 1978, Ser. No. 880,351
Claims priority, application Fed. Rep. of Germany, Aug. 25, 1977, 7372
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—73



254,979
BAG VENDING MACHINE
Henry Verbeke, Tannersbrook Rd., Chester, N.J. 07930
Filed Dec. 15, 1977, Ser. No. 860,922
Term of patent 14 years
Int. Cl. D20—*01*
U.S. Cl. D20—1

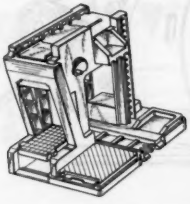


254,980
COMBINED KENO TICKET HOLDER WITH PAGER AND GAME RESULTS DISPLAY
David L. White, San Juan Capistrano, Calif.; Morton M. Goldstein, and Harry Kraft, both of Las Vegas, Nev., assignors to Kramor Industries, Ltd., Las Vegas, Nev.
Filed Oct. 20, 1977, Ser. No. 843,842
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—1

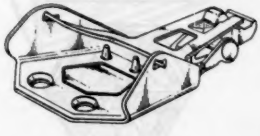


254,981
GAME BOARD
Tobin Wolf, 285 Aycrigg Ave., Passaic, N.J. 07055
Filed Jul. 29, 1977, Ser. No. 820,366
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—32

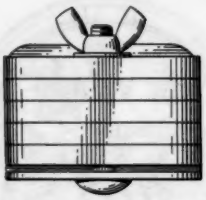
254,982
TOY RAILROAD STATION
Victor J. Fratarcangeli, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Feb. 10, 1978, Ser. No. 876,844
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—118



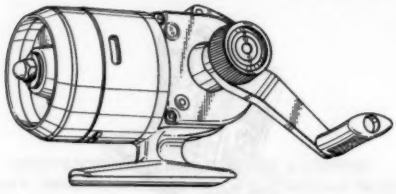
254,983
SKIBINDING
Bernt O. Hauglin, Röyken, Norway, assignor to A-S Royken Jernvarefabrik, Klokkarstua, Norway
Filed Aug. 30, 1977, Ser. No. 829,164
Claims priority, application Norway, Mar. 18, 1977, 7758203
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—230



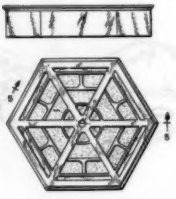
254,984
GOLF CLUB PRACTICE HEAD
Armand J. Goyette, Jr., 155 Rapin Pl., Buffalo, N.Y. 14211
Filed Sep. 5, 1978, Ser. No. 939,902
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—234



254,985
FISHING REEL
Yasomatsu Morishita, Kure, Japan, assignor to Ryobi Ltd., Fuchu, Japan
Filed Jan. 9, 1978, Ser. No. 868,143
Claims priority, application Japan, Aug. 20, 1977, 52-33064
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—25

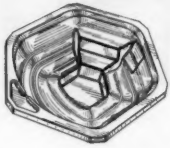


254,986
ROOM DEODORANT DISPENSER
Richard C. Palson, Medfield, and John C. Armstrong, Milton, both of Mass., assignors to The Pharmasol Corporation, Randolph, Mass.
Filed Dec. 18, 1978, Ser. No. 970,611
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—150



254,987
HIP PROSTHESIS
James T. Treace and Dan H. Treace, both of Germantown, Tenn., assignors to Richards Manufacturing Co., Inc., Memphis, Tenn.
Filed Oct. 31, 1977, Ser. No. 847,118
Term of patent 14 years
Int. Cl. D24—*03*
U.S. Cl. D24—33

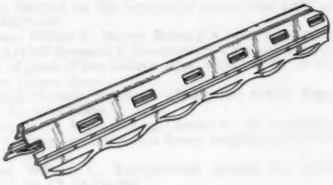
254,988
HYDROTHERAPY SPA
Robert H. Jones, and Lennard E. Nylin, both of San Jose, Calif., assignors to Viking Sauna Company, San Jose, Calif.
Filed Oct. 20, 1978, Ser. No. 953,090
Term of patent 14 years
Int. Cl. D24—*01;* D25—*99;* D23—*02*
U.S. Cl. D24—38



254,989
HOUSE OR THE LIKE
Elaine E. Sandman, 6925 N. Ridge Dr., Raleigh, N.C. 27609
Filed Dec. 27, 1977, Ser. No. 864,498
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—17

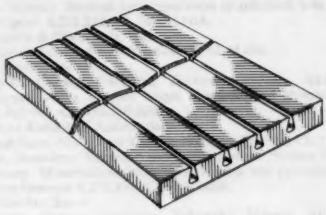
254,990
FACADE FOR A FURNITURE STORE
Claus Winter, Usedomstrasse 23, 2000 Hamburg 70, Fed. Rep. of Germany
Filed Jun. 21, 1977, Ser. No. 808,686
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D25—59

254,991
CORNER ANGLE IRON FOR CEILING PLASTERWORK
René S. Falcq, Chaudfontaine, Belgium, assignor to Société Anonyme Metal Deploye Belge, Sclessin-Ougrée, Belgium
Filed Nov. 1, 1977, Ser. No. 847,691
Claims priority, application Benelux, May 4, 1977, 5184800
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—74

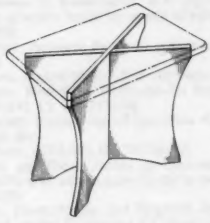


254,992
DISPOSABLE LADY'S RAZOR
David O. Chase, and Paul H. Pfuhl, both of Skaneateles, N.Y., assignors to American Safety Razor Company, Verona, Va.
Filed Mar. 21, 1978, Ser. No. 888,886
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—46

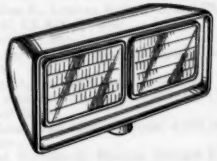
254,993
FLUME PLATFORM PANEL FOR ANIMAL CONFINEMENT PENS
Richard E. Bunger, and Roy J. Hancock, both of 5202 E. Washington, Phoenix, Ariz. 85034
Filed Jun. 12, 1978, Ser. No. 914,583
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—2



254,994
AQUARIUM STAND
Michael Miereanu, and Renee Miereanu, both of 15133 Ventura Blvd., Sherman Oaks, Calif. 91413
Filed Oct. 6, 1977, Ser. No. 839,828
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—12



254,995
DUAL LAMP DRIVING LIGHT
Bill R. Alsman, 2200 Christmas Tree La., Riverbank, Calif. 95367
Filed Apr. 21, 1978, Ser. No. 898,875
Term of patent 14 years
Int. Cl. D26—*06*
U.S. Cl. D26—35



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TO WHOM

PATENTS WERE ISSUED ON THE 13TH DAY OF MAY, 1980

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. B. Dick Company: *See*—
Zahradnik, George J., 4,202,266, Cl. 101-218.000.

A. H. Robins Company, Inc.: *See*—
Greenberg, Jack, 4,202,129, Cl. 43-131.000.

A Patent Partnership: *See*—
Mayer, George L., Jr.; and Schick, John D., 4,202,626, Cl. 355-52.000.

A.R.D. Anstalt: *See*—
Gabr, Saad Z. M., 4,203,147, Cl. 361-386.000.

A-Team, Inc., The: *See*—
Lawler, Cary R., 4,202,585, Cl. 312-15.000.

AB Gustavsberg: *See*—
Strom, Torsten E. T., 4,202,568, Cl. 285-336.000.

AB Sture Ljungdahl: *See*—
Petersson, Nils E., 4,202,150, Cl. 53-206.000.

Abbondanti, Alberto; and Stacey, Eric J., to Westinghouse Electric Corp. Force commutated static isolator circuit. 4,203,040, Cl. 307-65.000.

Abe, Akira; Kimura, Shoji; and Kuwabara, Yuzo, to Omron Tateisi Electronics Co. Korotkov sound sensor. 4,202,348, Cl. 128-680.000.

Abe, Takeo: *See*—
Masuda, Teruo; Watanabe, Nobuhiko; Abe, Takeo; Koike, Matsuhiro; Morita, Masayasu; Oguma, Yoshio; Hamaguchi, Yoshiharu; Hirata, Motonobu; Saito, Mamoru; Onoguchi, Kunio; Yamaguchi, Kazuyuki; and Hirose, Akira, 4,202,257, Cl. 99-348.000.

Abe, Tsutomu; Ikeda, Akihiko; and Sakurai, Tokio, to Asahi Kasei Kogyo Kabushiki Kaisha. Adsorbent for adsorbing organic compounds adsorbed on proteins. 4,202,775, Cl. 210-287.000.

Abernethy, Lynn W.; and Watts, Elvert S., to AMP Incorporated. Jack. 4,202,593, Cl. 339-125.00R.

Abraham, Edward D.; and Hartung, Rodney L., to Carver Foundry Products. Support table for foundry sand molding apparatus. 4,202,399, Cl. 164-203.000.

Acheson, Willard P.; Morris, Richard A.; Rennard, Raymond J.; and Viswanathan, Thiagarajan, to Gulf Research & Development Company. Method for the recovery of power from LHV gas. 4,202,168, Cl. 60-39.060.

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Rech, Werner; Welsch, Wolfgang; and Achter, Eugen, 4,203,050, Cl. 313-220.000.

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Addis, Kenneth J.; and McCollough, John K., Jr., to Milliken Research Corporation. Apparatus for the application of liquids to moving materials. 4,202,189, Cl. 68-205.00R.

Aedo, Dionisio M.: *See*—
Taya, Miguel M.; Aedo, Dionisio M.; and Ricard, Rene, 4,202,825, Cl. 260-345.200.

Afflerbaugh, Richard L.; and Ebling, Wendell V., to Baxter Travenol Laboratories, Inc. Ultrafiltration control system. 4,202,764, Cl. 210-22.00D.

Agency of Industrial Science & Technology, Ministry of International Trade & Industry: *See*—
Ishii, Eiichi; Nakane, Masanori; Ishikawa, Hiroshi; Uehara, Itsuki; and Miyake, Yoshizo, 4,202,917, Cl. 427-161.000.
Tateishi, Tetsuya, 4,202,670, Cl. 44-51.000.

AGFA-Gevaert, A.G.: *See*—
Stemme, Otto; Schroder, Rolf; Lermann, Peter; and Karl, Horst, 4,202,616, Cl. 354-173.000.
Waschk, Fritz; Webersik, Heinz; and Schinagl, Rudolf, 4,202,618, Cl. 355-3.0FU.

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Philippaerts, Herman A.; Pollet, Robert J.; Muller-Bardorff, Wolfgang; Saleck, Wilhelm; von Konig, Anita; Gauss, Walter; Moll, Franz; and Ghys, Theofiel H., 4,202,695, Cl. 430-8.000.
Van Goethem, Hugo V.; Stroobants, Marcel; and De Winter, Walter F., 4,202,697, Cl. 430-306.000.

Agip Nucleare S.p.A.: *See*—
Bezzi, Giovanni; Facchini, Alessandro; Martignani, Giovanni; and Pastore, Michele, 4,202,793, Cl. 252-301.10S.

Ahonen, Esko M., to Paraisten Kalkki Oy-Pargas Kalk AB. Glide-casting machine for the manufacturing of hollow slabs and equivalent. 4,202,658, Cl. 425-64.000.

Ainoura, Masato. Method for preparation of spherical hob for generation of gear. 4,202,222, Cl. 76-101.00A.

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Hvizdos, Leonard J., 4,202,678, Cl. 62-38.000.

Aisaka, Kazuo: *See*—
Terada, Osamu; Uwajima, Takayuki; Mihara, Akira; Aisaka, Kazuo; Akita, Hiroko; Nagai, Toshiaki; and Shimizu, Yoshiaki, 4,202,941, Cl. 435-190.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Sakakibara, Naoji; and Kawata, Shoji, 4,202,424, Cl. 180-176.000.

Akerkar, Anandrao S.; and Rutner, Herman, to Becton Dickinson & Company. Monoradioiodinated derivatives and precursors for production thereon. 4,202,874, Cl. 424-1.000.

Akita, Hiroko: *See*—
Terada, Osamu; Uwajima, Takayuki; Mihara, Akira; Aisaka, Kazuo; Akita, Hiroko; Nagai, Toshiaki; and Shimizu, Yoshiaki, 4,202,941, Cl. 435-190.000.

Akkerman, Neil H.; and Goans, Kip B., to Baker CAC, Inc. Safety valve or blowout preventer for use in a fluid transmission conduit. 4,202,368, Cl. 137-498.000.

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Enghag, Per, 4,202,921, Cl. 427-406.000.

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Madsen, Rud F.; Jensen, Jens H.; and Engvad, Jens C., 4,202,859, Cl. 422-245.000.

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Wenz, Barry; Karmen, Arthur; and Feng, Chi Shun, 4,202,665, Cl. 23-230.00B.

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Alig, Leo; Furst, Andor; Muller, Marcel; Kerb, Ulrich; Kieslich, Klaus; and Wiechert, Rudolf, to Hoffmann-La Roche Inc. D-Homopregnanes. 4,202,841, Cl. 424-311.000.

Alison, W. Evans. Equine vaginal speculum. 4,202,324, Cl. 128-20.000.

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Funke, Peter, 4,202,690, Cl. 75-224.000.

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Allen, Richard T.; Moyer, Rudolph H.; Sibbett, Donald J.; Anderson, Howard H.; Martner, Glen R.; and Willis, Don, to Geomet, Incorporated. In-line respirating pump. 4,202,212, Cl. 73-421.50R.

Alley, Bernard J.; Dake, James D.; and Dykes, Hiram W. H., to United States of America, Army. Ballistic modifiers and synthesis of the ballistic modifiers. 4,202,714, Cl. 149-109.400.

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Carlson, Charles E., 4,202,404, Cl. 164-423.000.
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Koff, Fred W.; Tunick, Allen A.; Sifniades, Stylianos; and Belden, Reed H., 4,202,765, Cl. 210-31.00R.
Kokta, Milan R.; Linares, Robert C.; and Di Giuseppe, Michael A., 4,202,930, Cl. 428-539.000.

Alonso, Agustin M.: *See*—
Zorrilla, Fermin; and Alonso, Agustin M., 4,202,310, Cl. 123-191.00A.

Alther, George A., to Smith International, Inc. Raise drill with elastomeric load absorbing means. 4,202,417, Cl. 175-320.000.

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Roth, Zdenek; and Altmann, Josef, 4,202,367, Cl. 137-187.000.

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Sherwood, William G.; Hodges, Donald R.; and Nikolic, Cvetko, 4,202,752, Cl. 204-222.000.

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Amendola, Steven C., to Future Research, Inc. Coal liquification process. 4,202,757, Cl. 208-10.000.

Amerace Corporation: *See*—
Borgstrom, Alan D., 4,202,591, Cl. 339-111.000.

American Can Company: *See*—
Pauls, Walter L.; and Miller, Fredric N., 4,202,852, Cl. 264-115.000.

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Behrens, Rudolf A., 4,202,963, Cl. 528-374.000.
Chang, Eugene Y. C.; and Saxon, Robert, 4,202,845, Cl. 525-302.000.
Floyd, Middleton B., Jr.; Weiss, Martin J.; Grudzinskas, Charles V.; and Chen, Sow-Mei L., 4,202,989, Cl. 560-118.000.
Wissner, Allan, 4,202,822, Cl. 260-340.90P.
Wissner, Allan; Weiss, Martin J.; and Bernady, Karel F., 4,202,988, Cl. 560-118.000.

American Ecosystems, Inc.: *See*—
Watts, Paul J.; Crawford, Lynn D.; and Nichols, Philip T., 4,202,363, Cl. 135-2.000.

Ametek, Inc.: *See*—
Bowen, John C., 4,202,320, Cl. 126-447.000.

Amory, Daniel: *See*—
Szadkowski, Stanislav; Amory, Daniel; and Thomas, Jean M., 4,202,473, Cl. 222-598.000.

AMP Incorporated: *See*—
Abernethy, Lynn W.; and Watts, Elvert S., 4,202,593, Cl. 339-125.00R.
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Simpson, Neville H.; and Dykeman, Fred E., 4,202,164, Cl. 57-232.000.

An, Viktor B.: *See*—
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Anaren Microwave, Inc.: *See*—
Gerst, Carl W.; Hair, Hugh A.; and Rehnmark, Stig L., 4,203,114, Cl. 343-100.0SA.

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Anderl, Peter: *See*—
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Anders, Dietmar, to Hermann Berstorff Maschinenbau GmbH. Machine for processing plastics materials. 4,202,633, Cl. 366-79.000.

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Allen, Richard T.; Moyer, Rudolph H.; Sibbett, Donald J.; Anderson, Howard H.; Martner, Glen R.; and Willis, Don, 4,202,212, Cl. 73-421.50R.

Anderson, Robert W. Female urinal. 4,202,058, Cl. 4-144.300.

Andres, Rudolf: *See*—
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Annett, Leland W., to Minnesota Mining and Manufacturing Company. Stapler including means for preventing double feeding of staples. 4,202,480, Cl. 227-8.000.

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Villari, Frank K.; Ellmann, Norbert W.; and Annis, Larry D., 4,202,325, Cl. 128-24.00R.

Anton Piller KG.: *See*—
Sachs, Klaus, 4,203,041, Cl. 307-67.000.

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Latash, Jury V.; Voronin, Alexei E.; Nikolaev, Vladimir A.; Pelts, Boris B.; Volokhonsky, Lev A.; Artemiev, Vladimir D.; Vlasov, Mikhail I.; Chernyak, Alexandr I.; Nikulin, Alexandr A.; Dub, Vladimir S.; Vasiliev, Yakov M.; Stul, Iosif N.; Mukha, Vitaly P.; Orlov, Gennady I.; Khasin, Kim M.; Naryshkin, Jury A.; Belsky, Valentin I; Veligura, Ilya L.; Bogdashich, Vladimir E.; Lisitsin, Vladimir A.; Mischenko, Alexandr V.; Kovalenko, Jury A.; Babin, Vladimir V.; Svitenko, Igor A.; Antonov, Vladimir I.; and Smolyarenko, Volemir D., 4,202,401, Cl. 164-252.000.

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Aoyama, Kenjiro: *See*—
Yamaguchi, Takao; Aoyama, Kenjiro; Niahio, Yukihiro; and Kazino, Sadayosi, 4,203,084, Cl. 335-202.000.

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Urano, Fumio; Arai, Akihiro; Kobayashi, Takumi; and Umetsu, Junji, 4,202,617, Cl. 354-268.000.

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Komatsu, Noboru; Arai, Tohru; and Fujita, Hinonori, 4,202,705, Cl. 148-6.110.

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Teodorescu, Constantin; Ceauselu, Constantin; and Ardeleanu, Stefan, 4,202,272, Cl. 104-91.000.

Arima, Yosiaki: *See*—
Kawashima, Kenichi; Arima, Yosiaki; Endo, Yoshihide; Suginuma, Atsushi; Uenishi, Akira; and Miyamoto, Seigo, 4,202,182, Cl. 62-511.000.

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Armco, Incl.: *See*—
Littmann, Martin F.; and Obman, Allan R., 4,202,711, Cl. 148-111.000.

Armstrong, Edward T., to TII Corporation (Telecommunications Industries, Inc.). System for pollution suppression. 4,202,371, Cl. 137-604.000.

Armstrong, Robert J.: *See*—
Kitteridge, John M.; and Armstrong, Robert J., 4,202,699, Cl. 430-302.000.

Arndt, Friedrich; and Boroschewski, Gerhard, to Schering Aktiengesellschaft. Carbanilic acid esters, process for making the same and herbicidal compositions containing same. 4,202,684, Cl. 71-100.000.

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Kitchener, William R.; and Sama, Stephen L., 4,203,029, Cl. 235-92.0PC.

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Latash, Jury V.; Voronin, Alexei E.; Nikolaev, Vladimir A.; Pelts, Boris B.; Volokhonsky, Lev A.; Artemiev, Vladimir D.; Vlasov, Mikhail I.; Chernyak, Alexandr I.; Nikulin, Alexandr A.; Dub, Vladimir S.; Vasiliev, Yakov M.; Stul, Iosif N.; Mukha, Vitaly P.; Orlov, Gennady I.; Khasin, Kim M.; Naryshkin, Jury A.; Belsky, Valentin I; Veligura, Ilya L.; Bogdashich, Vladimir E.; Lisitsin, Vladimir A.; Mischenko, Alexandr V.; Kovalenko, Jury A.; Babin, Vladimir V.; Svitenko, Igor A.; Antonov, Vladimir I.; and Smolyarenko, Volemir D., 4,202,401, Cl. 164-252.000.

Asahi Glass Company, Limited: *See*—
Oda, Yoshio; Suhara, Manabu; Goto, Shoziro; Hukushima, Takashi; Miura, Koji; and Hamano, Toshikatsu, 4,202,743, Cl. 204-98.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Abe, Tsutomu; Ikeda, Akihiko; and Sakurai, Tokio, 4,202,775, Cl. 210-287.000.
Kominami, Naoya; Fwkumi, Hirokazu; Yamawaki, Naokuni; and Nomura, Junji, 4,202,291, Cl. 119-3.000.
Miyake, Tetsuya; Ogawa, Norito; Asano, Motohisa; and Okuyama, Kazuo, 4,202,860, Cl. 423-6.000.
Takahashi, Gensho; Miyoshi, Kazuhito; and Tanaka, Yoneharu, 4,202,696, Cl. 430-306.000.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Urano, Fumio; Arai, Akihiro; Kobayashi, Takumi; and Umetsu, Junji, 4,202,617, Cl. 354-268.000.

Asai, Koichi; Kawada, Tohsuke; Iwaki, Yoshiyuki; and Kuroda, Ryozo, to Mitsubishi Denki Kabushiki Kaisha. Method of manufacturing stator core. 4,202,196, Cl. 72-137.000.

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Asano, Kiro; Saito, Tsuyoshi; Tanaka, Hiromitsu; and Enomoto, Satoru, to Kureha Kagaku Kogyo Kabushiki Kaisha. Process for the preparation of anti-transplanted sarcoma 180 tumorigenic substances. 4,202,885, Cl. 424-95.000.

Asano, Motohisa: *See*—
Miyake, Tetsuya; Ogawa, Norito; Asano, Motohisa; and Okuyama, Kazuo, 4,202,860, Cl. 423-6.000.

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Jacoby, Lawrence J.; Rosenau, Richard A.; Carter, Dorothy P.; Nielsen, Ralph H.; and Ash, Kenneth C., 4,202,862, Cl. 423-70.000.

Assistance Industrielle Dauphinoise S.A.: *See*—
Rutten, Pierre L.; and Danel, Francois H., 4,202,467, Cl. 222-20.000.

Ateliers des Charmilles S.A.: *See*—
Piguet, Pierre, 4,202,084, Cl. 29-156.80R.

Atlantic Richfield Company: *See*—
Johnson, Marvin F. L.; and Erickson, Henry, 4,202,798, Cl. 252-437.000.
Shawl, Edward T., 4,202,986, Cl. 560-25.000.
Statton, Gary L., 4,202,950, Cl. 525-123.000.
Voelz, Frederick L.; and Jewell, Roy G., 4,202,385, Cl. 141-59.000.

Atwood Vacuum Machine Company: *See*—
Leonhardt, Robert F., 4,202,243, Cl. 85-37.000.

Aubert, Rene, to Societe d'Usinage des Tubes pour l'Electricite S.U.T.E. Automatic device for installing self-locking straps. 4,202,384, Cl. 140-123.600.

Aument, Patrick E.: *See*—
de la Burde, Roger Z.; Aument, Patrick E.; and Utsch, Francis V., 4,202,357, Cl. 131-140.00R.

Automated Packaging Systems, Inc.: *See*—
Lerner, Bernard; and Liebhart, Dana J., 4,202,153, Cl. 53-459.000.

Avco Corporation: *See*—
Polastri, Robert S.; and Ruzicka, Harry L., Jr., 4,202,539, Cl. 269-70.000.

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Daugherty, Jack D.; Jacob, Jonah H.; and Mangano, Joseph A., 4,203,078, Cl. 331-94.5PE.

Avdel Limited: *See*—
Skinner, Edward A., 4,202,191, Cl. 72-10.000.

Avery, Alfred J. Heat exchange system. 4,202,406, Cl. 165-47.000.

Avery International Corporation: *See*—
Burke, Thomas F.; and Walker, Donald H., 4,202,600, Cl. 350-103.000.

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Uchiyama, Yasushi; and Awamura, Daikichi, 4,202,631, Cl. 356-394.000.

Ayer, Donald E., to Upjohn Company, The. 11-Deoxy-trans-4,5-didehydro-PGI$_1$ compounds. 4,202,970, Cl. 542-426.000.

Azikov, Boris A.: *See*—
Klimkovsky, Bronislav M.; Azikov, Boris A.; Zemtsov, Mikhail U.; Kusch, Sergei A.; and Nalivkin, Nikolai P., 4,202,439, Cl. 198-642.000.

Babin, Vladimir V.: *See*—
Latash, Jury V.; Voronin, Alexei E.; Nikolaev, Vladimir A.; Pelts, Boris B.; Volokhonsky, Lev A.; Artemiev, Vladimir D.; Vlasov, Mikhail I.; Chernyak, Alexandr I.; Nikulin, Alexandr A.; Dub, Vladimir S.; Vasiliev, Yakov M.; Stul, Iosif N.; Mukha, Vitaly P.; Orlov, Gennady I.; Khasin, Kim M.; Naryshkin, Jury A.; Belsky, Valentin I; Veligura, Ilya L.; Bogdashich, Vladimir E.; Lisitsin, Vladimir A.; Mischenko, Alexandr V.; Kovalenko, Jury A.; Babin, Vladimir V.; Svitenko, Igor A.; Antonov, Vladimir I.; and Smolyarenko, Volemir D., 4,202,401, Cl. 164-252.000.

Babington, Ronald G.; and Harrington, F. Eugene, to Sandoz, Inc. Prolactin secretion inhibitors. 4,202,897, Cl. 424-250.000.

Bach, Hartwig C., to Monsanto Company. Fibers of arylene oxadiazole-/arylene N-alkylhydrazide copolymer. 4,202,962, Cl. 528-363.000.

Bach, Nicholas J.: *See*—
Kornfeld, Edmund C.; and Bach, Nicholas J., 4,202,979, Cl. 546-67.000.

Bachand, Carol: *See*—
Monkovic, Ivo; Bachand, Carol; and Wong, Henry, 4,202,982, Cl. 546-89.000.

Bachley, Peter V. Drafting apparatus. 4,202,111, Cl. 33-444.000.

Backteman, Hans U. Solid container coupling device. 4,202,643, Cl. 403-33.000.

Bader, Hartmann, to Sulzer Brothers Limited. Drop plate for an electrical stop motion of a weaving machine. 4,202,380, Cl. 139-368.000.

Baer, Edmund: *See*—
Ernst, Gunter; Baer, Edmund; and Wurz, Dieter, 4,202,847, Cl. 261-161.000.

Baghdady, Elie J. Radar method and apparatus. 4,203,113, Cl. 343-14.000.

Bailey, William V.: *See*—
Couch, Richard W., Jr.; and Bailey, William V., 4,203,022, Cl. 219-121.00P.

Baird Corporation: *See*—
Grenier, Raymond P., 4,203,035, Cl. 250-363.00S.

Baker CAC, Inc.: *See*—
Akkerman, Neil H.; and Goans, Kip B., 4,202,368, Cl. 137-498.000.

Baker International Corporation: *See*—
Sharp, Keith W.; and Sparlin, Derry D., 4,202,411, Cl. 166-244.00C.

Baker, Richard H., to Exxon Research & Engineering Co. High-voltage converter circuit. 4,203,151, Cl. 363-43.000.

Ball, Andrew C. Fire lighters. 4,202,669, Cl. 44-40.000.

Ball Corporation: *See*—
Rodenberger, Phillip R.; and Smith, William A., 4,202,674, Cl. 55-108.000.

Ballard, Samuel S.; and Vanham, Ernest E., to Sanders Associates, Inc. Submarine communication system. 4,203,109, Cl. 340-850.000.

Ballast-Nedam Groep N.V.: *See*—
Middelbeek, Cornelis G., 4,202,778, Cl. 210-522.000.

Baltschun, Horst, to SMG Suddeutsche Maschinenbau-Gesellschaft mbH. Tool protection arrangement for hydraulic presses. 4,202,433, Cl. 192-129.00A.

Ban, Masuo: *See*—
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Baraff, David R.: *See*—
Naguib, Hussein M.; Baraff, David R.; and Kos, Steven, 4,203,119, Cl. 346-76.0PH.

Barlage, Bruno, to H. Niemeyer Sohne GmbH & Co. KG. Soil cultivating machine. 4,202,415, Cl. 172-125.000.

Barmag Barmer Maschinenfabrik Aktiengesellschaft: *See*—
Turk, Herbert; Schiminski, Herbert; and Lenk, Erich, 4,202,163, Cl. 57-58.950.

Barna, Alex J. Compound bow. 4,202,316, Cl. 124-24.00R.

Barrows, George T.: *See*—
Talbot, Tully W.; Barrows, George T.; and Thompson, Granville B., 4,202,887, Cl. 424-154.000.

BASF Aktiengesellschaft: *See*—
Hoerauf, Werner; Pirzer, Hans; Guenther, Ernst; Neumann, Eckart; and Dietrich, Ernst, 4,202,375, Cl. 138-39.000.
Maechtle, Walter; and Klodwig, Utz, 4,202,632, Cl. 356-427.000.
Merger, Franz; and Nestler, Gerhard, 4,202,199, Cl. 568-793.000.

BASF Wyandotte Corporation: *See*—
Ciko, John D.; Ward, Robert A.; and Cramer, John J., 4,202,800, Cl. 252-543.000.
Taylor, James D., 4,202,956, Cl. 528-75.000.

Baskov, Jury A.: *See*—
Shafranovsky, Alexandr V.; Olevsky, Viktor M.; Chubukov, Vladimir K.; Baskov, Jury A.; and Dmitriev, Konstantin V., 4,202,846, Cl. 261-142.000.

Bassler, Gerd: *See*—
Armbruster, Franz; Paoli, Albano; Bassler, Gerd; Sitka, Hans-Peter; and Schmidt, Gunter, 4,203,020, Cl. 219-93.000.

Bates, John F.; and Popplewell, James M., to Olin Corporation. Corrosion resistant copper base alloys for heat exchanger tube. 4,202,708, Cl. 148-11.50C.

Bates, Laurence H. J., to G. & S. Allgood (Holdings) Limited. Door handle mechanisms. 4,202,575, Cl. 292-347.000.

Bathen, Roland. Machine tool control system. 4,203,062, Cl. 318-571.000.

Batjukov, Vladimir I.; Vijugov, Oleg N.; Fadeev, Alexandr I.; Shapkin, Alexandr F.; and Dyatlov, Lev E. Gripping means for fuel assemblies of nuclear reactor. 4,202,727, Cl. 176-30.000.

Bator, Cathryn D.: *See*—
Porzel, Rita E.; and Bator, Cathryn D., 4,202,804, Cl. 260-17.40R.

Battelle-Institut e.V.: *See*—
Reiner, Roland; Heide, Helmut; and Koster, Kari, 4,202,055, Cl. 3-1.910.

Batz, Hans-Georg; Stellner, Klaus; Linke, Hans-Ralf; and Weimann, Gunter, to Boehringer Mannheim GmbH. Alkylolamides of iodizable amino acids and immune test reagents containing them. 4,202,873, Cl. 424-1.000.

Batzold, John S.: *See*—
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Bauer Kassenfabrik AG: *See*—
Wieland, Jakob, 4,202,587, Cl. 312-219.000.

Baughman, Ernest H.: *See*—
Sabol, Albert R.; and Baughman, Ernest H., 4,202,781, Cl. 252-32.7HC.

Baxter Travenol Laboratories, Inc.: *See*—
Afflerbaugh, Richard L.; and Ebling, Wendell V., 4,202,764, Cl. 210-22.00D.

Bayer Aktiengesellschaft: *See*—
Beck, Manfred; Schnetger, Jochen; Serini, Volker; and Pampus, Gottfried, 4,202,949, Cl. 525-92.000.
Fitzky, Hans G.; Schmitt, Franz; Bollongino, Norbert; and Rehrmann, Helmut, 4,203,067, Cl. 324-58.50C.
Klein, Alfons; Knust, Ernst; Kron, Rudolf; and Wedemeyer, Karlfried, 4,203,145, Cl. 361-317.000.
Maurer, Fritz; Hammann, Ingeborg; and Behrenz, Wolfgang, 4,202,889, Cl. 424-200.000.
Moretto, Hans-Heinrich; de Montigny, Armand; Steinberger, Helmut; Sattlegger, Hans; and Larking, Ingrid, 4,202,807, Cl. 260-29.1SB.
Schlak, Ottfried; and Moretto, Hans-Heinrich, 4,202,831, Cl. 556-467.000.

Bayer Atkiengesellschaft: *See*—
de Montigny, Armand; Toepsch, Hans; and Buchner, Werner, 4,202,929, Cl. 428-452.000.

Bayly, Russell J.; Chambers, Virginia E. M.; and Monks, Reginald. Selenium-75 labelled derivatives of folates. 4,202,976, Cl. 544-261.000.

BBC Brown Boveri & Company Limited: *See*—
Kaufmann, Meinolph, 4,202,608, Cl. 350-339.00R.
Kmetz, Allan R., 4,203,104, Cl. 340-754.000.
Wild, Peter, 4,202,606, Cl. 350-336.000.

Bechtel, Jon H., to Robertshaw Controls Company. Solid state ignition system. 4,203,052, Cl. 315-209.0CD.

Beck, John W.; and McCown, Donald P., to International Business Machines Corporation. Dual mode read preamplifier with electrical short detector. 4,203,137, Cl. 360-31.000.

Beck, Manfred; Schnetger, Jochen; Serini, Volker; and Pampus, Gottfried, to Bayer Aktiengesellschaft. Branched segment polymers. 4,202,949, Cl. 525-92.000.

Becker, Bernd; Forch, Hans; Helfrich, Adam; and Jung, Gottfried, to Carl Freudenberg, Firma. Sealing ring. 4,202,555, Cl. 277-153.000.

Becker, Reinhold: *See*—
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Becker, Ronald K.; and Korb, Donald R., to SyntexLaboratories, Inc. Method and apparatus for manufacturing plastic lenses. 4,202,226, Cl. 82-12.000.

Becker, Willi, to Heidelberger Druckmaschinen Aktiengesellschaft. Transfer drum for printing presses with devices for gripping the leading and trailing edges of a sheet which is being imprinted. 4,202,268, Cl. 101-409.000.

Beckman Instruments, Inc.: *See*—
Buzza, Edmund E.; and Meyer, Richard C., 4,202,747, Cl. 204-195.00R.
Edwards, John R., 4,202,487, Cl. 233-1.00A.
Smith, Leland B.; McIntyre, Robert A.; and Pawlak, Raymond M., 4,202,354, Cl. 128-731.000.

Becton Dickinson & Company: *See*—
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Behrens, Rudolf A., to American Cyanamid Company. Vulcanization system for thiodiethanol-based elastomers. 4,202,963, Cl. 528-374.000.

Behrenz, Wolfgang: *See*—
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Belden, Reed H.: *See*—
Koff, Fred W.; Tunick, Allen A.; Sifniades, Stylianos; and Belden, Reed H., 4,202,765, Cl. 210-31.00R.
Bell & Howell Company: *See*—
Parker, Robert R., 4,202,611, Cl. 352-179.000.
Bell, Michael. Weather-proof garment. 4,202,053, Cl. 2-84.000.
Bell Telephone Laboratories, Incorporated: *See*—
Dragone, Corrado; and Gans, Michael J., 4,203,105, Cl. 343-781.00P.
Gordon, James P.; Nahory, Robert E.; Pollack, Martin A.; and Worlock, John M., 4,203,124, Cl. 357-13.000.
Moran, John C., 4,203,030, Cl. 235-92.0CC.
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Latash, Jury V.; Voronin, Alexei E.; Nikolaev, Vladimir A.; Pelts, Boris B.; Volokhonsky, Lev A.; Artemiev, Vladimir D.; Vlasov, Mikhail I.; Chernyak, Alexandr I.; Nikulin, Alexandr A.; Dub, Vladimir S.; Vasiliev, Yakov M.; Stul, Iosif N.; Mukha, Vitaly P.; Orlov, Gennady I.; Khasin, Kim M.; Naryshkin, Jury A.; Belsky, Valentin I; Veligura, Ilya L.; Bogdashich, Vladimir E.; Lisitsin, Vladimir A.; Mischenko, Alexandr V.; Kovalenko, Jury A.; Babin, Vladimir V.; Svitenko, Igor A.; Antonov, Vladimir I.; and Smolyarenko, Volemir D., 4,202,401, Cl. 164-252.000.
Bendix Corporation, The: *See*—
Ewald, Jerome T., 4,202,248, Cl. 91-375.00A.
Bendt, Anders. Protecting device for edges. 4,202,449, Cl. 206-453.000.
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Beningfield, Harley W.; and Sparks, Ward L., to Rockwell International Corporation. Reduction of impulse noise contribution to receiver squelch threshold. 4,203,072, Cl. 455-223.000.
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Benser, Earl H., to United States of America, Air Force. Electronic tripod technique. 4,202,516, Cl. 244-3.150.
Bereiter, Rolf; and Jachimowski, Alexander, to Von Roll AG. Furnace flue apparatus for improved fly ash separation. 4,202,280, Cl. 110-216.000.
Berendt, Hans-Ulrich: *See*—
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Berg, William F., to Hudson Products Corporation. Air cooled condenser. 4,202,405, Cl. 165-110.000.
Berggren, Donald R. Camper shell structure. 4,202,579, Cl. 296-156.000.
Bergwerksverband GmbH: *See*—
Gappa, Gunther; Juntgen, Harald; and Klein, Jurgen, 4,202,770, Cl. 210-96.100.
Luke, Willy; and Gabriel, Gunter, 4,202,733, Cl. 201-1.000.
Berkowitz, Irving L.; and Bourgeois, John J., to Kason Hardware Corporation. Safety closure system. 4,202,573, Cl. 292-223.000.
Berkowitz, Milton. Hanger for hanging fabric. 4,202,451, Cl. 206-526.000.
Bernady, Karel F.: *See*—
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Bernhard Forster, Firma: *See*—
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Berson, Steven. Sailing training device. 4,202,114, Cl. 35-11.00A.
Bethlehem Steel Corporation: *See*—
Greenbaum, Robert R., 4,202,734, Cl. 201-6.000.
Hlinka, Joseph W.; Whitmore, Bruce C.; and Ozgu, Mustafa R., 4,202,397, Cl. 164-82.000.
Betrue, Norman A., Sr. Construction device. 4,202,149, Cl. 52-699.000.
Bezzi, Giovanni; Facchini, Alessandro; Martignani, Giovanni; and Pastore, Michele, to Agip Nucleare S.p.A. Production of microspheres of thorium oxide, uranium oxide and plutonium oxide and their mixtures containing carbon. 4,202,793, Cl. 252-301.10S.
Bi-Modal Corporation: *See*—
Browne, Kenneth A.; Cripe, Alan R.; and Hindin, Eugene, 4,202,276, Cl. 105-165.000.
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Browne, Kenneth A.; Cripe, Alan R.; and Hindin, Eugene, 4,202,454, Cl. 213-86.000.
Biche, Barton A., to Bunker Ramo Corporation. Identification means for electrocardiographic monitoring instruments or the like. 4,202,351, Cl. 128-696.000.
Bickel, Hans: *See*—
Kocsis, Karoly; Fechtig, Bruno; and Bickel, Hans, 4,202,900, Cl. 424-251.000.
Bidegain, Pierre, to Bidegain S.A. Shoe, more particularly for toddlers. 4,202,117, Cl. 36-112.000.
Bidegain S.A.: *See*—
Bidegain, Pierre, 4,202,117, Cl. 36-112.000.
Bielefelder Kuchenmaschinen-u. Transport-Geratefabrik vom Braucke GmbH: *See*—
vom Braucke, Hans; vom Braucke, Manfred; and Schuring, Walter, 4,202,414, Cl. 172-42.000.
Bilanzich, Lydia K. Extendable infant sheet and sleeper. 4,202,052, Cl. 2-69.500.
Billitzer, Edward P.: *See*—
DeParales, Lawrence T.; and Billitzer, Edward P., 4,202,459, Cl. 220-90.400.
Bills, John E. Pocket brush. 4,202,361, Cl. 132-123.000.
Billy The Kid, Inc.: *See*—
Breck, Louis W., Jr., 4,202,447, Cl. 206-389.000.
Bils, Robert F. Specimen processing apparatus for microscopy. 4,202,289, Cl. 118-50.000.
Biotronik Mess- und Therapiegerate GmbH & Co.: *See*—
Blaser, Reinhard, 4,202,341, Cl. 128-419.0PG.
Keller, John W., Jr., 4,202,342, Cl. 128-419.0PG.
Richter, Gerolf; and Shanks, Scott B., 4,203,019, Cl. 219-72.000.
Bishop, Larry D.; and Parker, Jack C., Jr., to Wescom, Inc. Low power dissipation series regulator for PCM repeater lines. 4,203,141, Cl. 361-18.000.
Bitrolf, Ehrenfried, to Richard Wolf GmbH. Device for removing excrescences and polyps. 4,202,338, Cl. 128-303.150.
Bitterberg, Friedhelm, to Thyssen Industrie Aktiengesellshaft. Device for protecting self-propelled rail vehicles against swaying. 4,202,275, Cl. 105-61.000.
Black & Decker Inc.: *See*—
Alessio, Lorenzo E., 4,202,140, Cl. 51-395.000.
Black, Philip W., to International Standard Electric Corporation. Glass manufacture. 4,202,682, Cl. 65-136.000.
Blaschke, Kurt; and Roob, Josef, to Stahl- und Apparatebau Hans Leffer GmbH. Method and apparatus for sinking a cased borehole for producing cased pile foundations. 4,202,416, Cl. 175-94.000.
Blaser, Paul: *See*—
Schmidt, Helmut; Strobel, Walter; Treude, Gunter; and Blaser, Paul, 4,202,640, Cl. 400-491.200.
Blaser, Reinhard, to Biotronik Mess- und Therapiegerate GmbH & Co. Cardiac pacemaker circuit with variable operation. 4,202,341, Cl. 128-419.0PG.
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Grigorenko, Anatoly S.; Moroz, Jury A.; Kuznetsov, German N.; Vimba, Vladimir I.; Landyshev, Vladimir V.; Bocharov, Jury A.; and Safonov, Anatoly V., 4,202,174, Cl. 60-413.000.
Bock, Thomas: *See*—
Wirtzfeld, Alexander; and Bock, Thomas, 4,202,339, Cl. 128-419.0PG.
Bodig, Bernd: *See*—
Jundt, Werner; and Bodig, Bernd, 4,202,304, Cl. 123-148.00E.
Boehringer Mannheim GmbH: *See*—
Batz, Hans-Georg; Stellner, Klaus; Linke, Hans-Ralf; and Weimann, Gunter, 4,202,873, Cl. 424-1.000.
Boeing Company, The: *See*—
Brunner, Dietrich W., 4,202,172, Cl. 60-245.000.
Champoux, Louis A.; Falcioni, Joseph G.; and Mendels, Morton, 4,202,242, Cl. 85-7.000.
Fletcher, John J., 4,202,519, Cl. 244-214.000.
Waters, Kenneth L., 4,202,061, Cl. 4-317.000.
Bogdashich, Vladimir E.: *See*—
Latash, Jury V.; Voronin, Alexei E.; Nikolaev, Vladimir A.; Pelts, Boris B.; Volokhonsky, Lev A.; Artemiev, Vladimir D.; Vlasov, Mikhail I.; Chernyak, Alexandr I.; Nikulin, Alexandr A.; Dub, Vladimir S.; Vasiliev, Yakov M.; Stul, Iosif N.; Mukha, Vitaly P.; Orlov, Gennady I.; Khasin, Kim M.; Naryshkin, Jury A.; Belsky, Valentin I; Veligura, Ilya L.; Bogdashich, Vladimir E.; Lisitsin, Vladimir A.; Mischenko, Alexandr V.; Kovalenko, Jury A.; Babin, Vladimir V.; Svitenko, Igor A.; Antonov, Vladimir I.; and Smolyarenko, Volemir D., 4,202,401, Cl. 164-252.000.
Bollongino, Norbert: *See*—
Fitzky, Hans G.; Schmitt, Franz; Bollongino, Norbert; and Rehrmann, Helmut, 4,203,067, Cl. 324-58.50C.
Bond, Roy F.: *See*—
Hancock, Robert D.; Bond, Roy F.; and Green, Brian R., 4,202,944, Cl. 521-32.000.
Bonk, Henry W.; and Shah, Tilak M., to Upjohn Company, The. Thermoplastic polyurethane elastomers from polyoxypropylene polyoxyethylene block copolymers. 4,202,957, Cl. 528-77.000.
Boos, Walter R.: *See*—
von Schmeling, Bogislav; and Boos, Walter R., 4,202,904, Cl. 424-330.000.
Borel, Jacques M. L. Shot simulating apparatus. 4,202,115, Cl. 35-25.000.
Borg Instruments, Inc.: *See*—
Johnston, Samuel A., 4,202,081, Cl. 29-25.410.
Borg-Warner Corporation: *See*—
Gaylord, Norman G., 4,202,955, Cl. 526-272.000.
Borgstrom, Alan D., to Amerace Corporation. Apparatus for the remote grounding, connection and disconnection of high voltage electrical circuits. 4,202,591, Cl. 339-111.000.
Boroschewski, Gerhard: *See*—
Arndt, Friedrich; and Boroschewski, Gerhard, 4,202,684, Cl. 71-100.000.
Borrevang, Poul: *See*—
Guddal, Erling; and Borrevang, Poul, 4,202,817, Cl. 260-239.100.
Bostrom, David A.: *See*—
Fitting, William L., 4,202,529, Cl. 254-89.00H.
Boucher, Robert; and Foulquier-Gazagnes, Andre. Photographic printing process, and composition and device for use therein. 4,202,662, Cl. 8-444.000.
Bourgeois, John J.: *See*—
Berkowitz, Irving L.; and Bourgeois, John J., 4,202,573, Cl. 292-223.000.
Bourgeois, Michel; Manevy, Georges; and Roux, Jean-Pierre, to Commissariat a l'Energie Atomique. Method for dry reprocessing of irradiated nuclear fuels. 4,202,861, Cl. 423-19.000.

Bourgeois, Ronald D. Modular compartmentalized conveyor belt system. 4,202,441, Cl. 198-779.000.

Bowen, John C., to Ametek, Inc. Solar energy collector assembly. 4,202,320, Cl. 126-447.000.

Bowles, William M.; and Cox, Duncan B., Jr., to Charles Stark Draper Laboratory, Inc., The. Pseudo-random-number code detection and tracking system. 4,203,070, Cl. 375-1.000.

Bowles, William M.; Cox, Duncan B., Jr.; and Guinon, Walter J., to Charles Stark Draper Laboratory, Inc., The. Pseudo-random-number-code-detection and tracking system. 4,203,071, Cl. 375-1.000.

Boxall, Frank S. Hybrid circuit using current mirror circuits. 4,203,012, Cl. 179-170.0NC.

Boyd, James C., to Diebold, Incorporated. Circuit for reducing power consumption in battery operated microprocessor based systems. 4,203,153, Cl. 364-200.000.

Boyesen, Eyvind, to Performance Industries, Inc. Fuel porting for two cycle internal combustion engine. 4,202,298, Cl. 123-73.00R.

Boyesen, Eyvind, to Performance Industries, Inc. Two cycle internal combustion engine. 4,202,299, Cl. 123-73.00A.

Bradford, Donald R.; and White, James E., to Swiss Aluminium Ltd. Reduction cell hood. 4,202,753, Cl. 204-247.000.

Bradley, Timothy G.; and McAdam, Raymond L., to Johns-Manville Corporation. Filtration of vegetable based matter. 4,202,910, Cl. 426-423.000.

Braeckelmann, Walter, to Siemens Aktiengesellschaft. Passive circuit element for influencing pulses. 4,203,081, Cl. 333-138.000.

Brakebill, Harold G., to Robertshaw Controls Company. Valve positioner and method of making the same. 4,202,524, Cl. 251-28.000.

Brandenstein, Manfred: *See*—
Olschewski, Armin; Brandenstein, Manfred; Krug, Manfred; and Martin, Horst, 4,202,558, Cl. 280-11.280.

Brandt, Michael W. Blade holder and nozzle assembly. 4,202,469, Cl. 222-91.000.

Braudo, Evgeny E.: *See*—
Nesmeyanov, Alexandr N.; Rogozhin, Sergei V.; Tolstoguzov, Vladimir B.; Misjurev, Vladimir I.; Ershova, Vera A.; and Braudo, Evgeny E., 4,202,908, Cl. 426-72.000.

Breck, Louis W., Jr., to Billy The Kid, Inc. Collating and bundling belt loops. 4,202,447, Cl. 206-389.000.

Brehm, William F.; and McGuire, Joseph C., to United States of America, Energy. Radionuclide deposition control. 4,202,730, Cl. 176-37.000.

Breitschwerdt, Werner; Andres, Rudolf; Heiss, Werner; and Fussnegger, Wolfgang, to Daimler-Benz Aktiengesellschaft. Motor vehicle provided with a hatch-back door closing off a storage space. 4,202,577, Cl. 296-24.00R.

Brendle, Marcel C., to Dow Corning GmbH. Method for improving the lubricating properties of solid lubricants. 4,202,780, Cl. 252-12.000.

Brickell, Christopher G.: *See*—
O'Hare, David H.; Brickell, Christopher G.; and Spilman, Lindsay G., 4,203,027, Cl. 219-275.000.

Bricot, Claude; and Lehureau, Jean-Claude, to Thomson-Brandt. Optical player with half wave plate. 4,203,133, Cl. 358-128.500.

Briscoe, James E.: *See*—
Burnham, John W.; Briscoe, James E.; and Elphingstone, Eugene A., 4,202,795, Cl. 252-332.000.

Bristol-Myers Company: *See*—
Monkovic, Ivo; Bachand, Carol; and Wong, Henry, 4,202,982, Cl. 546-89.000.

British Gas Corporation: *See*—
Bull, Reginald B.; Duffill, Colin; and Usmar, Ronald A., 4,202,216, Cl. 73-639.000.

Bromberg, Howard M., to Flexi Group, Inc., The. Game. 4,202,546, Cl. 273-93.00R.

Brooks, Brian E., to Coal Industry (Patents) Limited. Communication system. 4,203,010, Cl. 179-82.000.

Brooks, Lester A.: *See*—
Doe, Lester A., Jr.; and Brooks, Lester A., 4,202,782, Cl. 252-51.50A.

Brooks, Robert S. H. Popcorn stirrer. 4,202,256, Cl. 99-323.500.

Browne, Kenneth A.; Cripe, Alan R.; and Hindin, Eugene, to Bi-Modal Corporation. Self-steering wheel-set for convertible railway vehicle. 4,202,276, Cl. 105-165.000.

Browne, Kenneth A.; Cripe, Alan R.; and Hindin, Eugene, to Bi-Modal Corporation. Convertible rail-highway semi-trailer. 4,202,277, Cl. 105-215.00C.

Browne, Kenneth A.; Cripe, Alan R.; and Hindin, Eugene, to Bi-Modal Corporation. Coupler to connect convertible rail-highway vehicles end to end. 4,202,454, Cl. 213-86.000.

Brubaker, Gaylen R., to FMC Corporation. Peroxygen bleaching and compositions therefor. 4,202,786, Cl. 252-102.000.

Bruce, Gary; and Spector, George. Moss killer. 4,202,858, Cl. 422-243.000.

Brumann, Joachim, to Felten & Guilleaume Carlswerk AG. Apparatus for treating optical fibers by spark erosion. 4,203,028, Cl. 219-384.000.

Brunner, Dietrich W., to Boeing Company, The. Boost survivable ramjet elements. 4,202,172, Cl. 60-245.000.

Buchanan, Lloyd W.; Eberhart, Noah E.; and Szabo, Arthur D., to Westinghouse Electric Corp. Thermally protected dynamoelectric machine. 4,203,045, Cl. 310-68.00C.

Bucher, Robert R., to Jakob Muller, Forschungs und Finanz AG. Ribbon fabric, method for the manufacture thereof and ribbon loom for carrying out the method. 4,202,381, Cl. 139-383.00R.

Buchner, Werner: *See*—
de Montigny, Armand; Toepsch, Hans; and Buchner, Werner, 4,202,929, Cl. 428-452.000.

Buck, Josef J., to Magnetic Controls Company. Access module. 4,203,066, Cl. 324-51.000.

Buehring, Walter, to Siemens Aktiengesellschaft. Radar device including a circuit arrangement for reducing interference. 4,203,111, Cl. 343-7.700.

Buhrer, Werner, to Transver AG. Conveyor belt curve. 4,202,443, Cl. 198-831.000.

Buit, Klaas, to B.V. Neratoom. Method of assembling the parts of a heat exchanger, and a heat exchanger thus assembled. 4,202,086, Cl. 29-157.30R.

Bukhtiyarov, Ivan D.; An, Viktor B.; Demin, Alexei S.; Farshatov, Marat N.; and Slepchuk, Valery A., to Spetsialnoe Opytnoe Proektno-Konstruktorsko-Tekhnologicheskoe Bjuro Sibirskogo Otdelenia Vsesojuznoi Akademii Selskokhozyaistvennykh Nauk Imeni v.i. Lenina. Device for measuring power output of an internal-combustion engine. 4,202,206, Cl. 73-116.000.

Bull, Reginald B.; Duffill, Colin; and Usmar, Ronald A., to British Gas Corporation. Ultrasonic testing. 4,202,216, Cl. 73-639.000.

Bullard, James: *See*—
Lester, Frank R.; and Bullard, James, 4,202,068, Cl. 15-28.000.

Bunker Ramo Corporation: *See*—
Biche, Barton A., 4,202,351, Cl. 128-696.000.
Inouye, Hiromasa; Otsuki, Tomonari; and Saito, Tsukasa, 4,202,595, Cl. 339-174.000.

Burbo, James H.; and Hartman, Louis P., to International Telephone and Telegraph Corporation. Training aid for use with night vision apparatus. 4,202,601, Cl. 350-159.000.

Buret, Jacqui: *See*—
Allain, Albert; and Buret, Jacqui, 4,202,728, Cl. 176-30.000.
Allain, Albert; Buret, Jacqui; and Plagnard, Andre, 4,202,729, Cl. 176-30.000.

Burke, James W. Automatic starting fluid dispenser. 4,202,309, Cl. 123-180.00R.

Burke, Thomas F.; and Walker, Donald H., to Avery International Corporation. Diced retroreflective sheeting. 4,202,600, Cl. 350-103.000.

Burnham, J. Kellogg; and Gottfried, Mario H., Jr. Air-borne support and lift mechanism adapted to aircraft. 4,202,518, Cl. 244-12.100.

Burnham, John W.; Briscoe, James E.; and Elphingstone, Eugene A., to Halliburton Company. Methods and additives for delaying the release of chemicals in aqueous fluids. 4,202,795, Cl. 252-332.000.

Burrage, Martin E.: *See*—
Lee, Cedric; and Burrage, Martin E., 4,202,746, Cl. 204-181.00C.

Burri, Peter, to Ciba-Geigy Corporation. Pressure-sensitive or heat-sensitive recording material containing a carbazolyl methane compound. 4,202,820, Cl. 260-315.000.

Burroughs Corporation: *See*—
Shanks, Roy R., 4,203,123, Cl. 357-2.000.

Burton, George: *See*—
Taylor, Andrew W.; Burton, George; and Clayton, John P., 4,202,973, Cl. 544-21.000.

Bush, Lyman F.; and Weaver, Dennis R. Rebar safety cap. 4,202,378, Cl. 138-96.00R.

Busygin, Valery P.: *See*—
Smirnov, Boris A.; Busygin, Valery P.; Komina, Lidia S.; Mochalov, Vyacheslav N.; Shagalov, Lev V.; and Gruzdev, Evgeny A., 4,202,314, Cl. 128-218.00F.

Butler, Denis V., to Plessey Handel und Investments AG. Fluid switch with reflected shock wave. 4,202,374, Cl. 137-827.000.

Buzza, Edmund E.; and Meyer, Richard C., to Beckman Instruments, Inc. Flow cell fluid and sample supply mechanism. 4,202,747, Cl. 204-195.00R.

B.V. Neratoom: *See*—
Buit, Klaas, 4,202,086, Cl. 29-157.30R.
Hirs, Gilles G., 4,202,552, Cl. 277-26.000.

Byrne, Joseph H., Jr., to Joy Manufacturing Company. Hydraulic torque indicator. 4,202,208, Cl. 73-139.000.

C. G. Conn, Ltd.: *See*—
Southard, James S.; and Mott, Daniel R., 4,202,239, Cl. 84-1.260.

C. L. Frost & Son, Inc.: *See*—
Weis, Siegfried K., 4,202,219, Cl. 74-254.000.

C. R. Bard, Inc.: *See*—
Elson, Edward E., 4,202,334, Cl. 128-272.000.

Caglione, Alexander J.: *See*—
Weber, Willis W.; Caglione, Alexander J.; Frost, Albert C.; and Weeks, Thomas J., Jr., 4,202,870, Cl. 423-630.000.

Cahen, George L., Jr.: *See*—
Stoner, Glenn E.; and Cahen, George L., Jr., 4,202,740, Cl. 204-130.000.

Cahill, Paul J.; and Udelhofen, John H., to Standard Oil Company (Indiana). Tertiary carbinamine modified mannich compositions and lubricants containing same. 4,202,784, Cl. 252-51.50R.

Calabrese, Peter J.: *See*—
Klavan, Irving L.; Calabrese, Peter J.; Finch, Theron R.; Greenberg, Arthur; and McElroy, Robert P., 4,202,620, Cl. 355-10.000.
Klavan, Irving L.; Calabrese, Peter J.; Finch, Theron R.; Greenberg, Arthur; and McElroy, Robert P., 4,202,913, Cl. 430-106.000.

Calgon Corporation: *See*—
Diehl, Richard C.; and Walker, Jerry L., 4,202,671, Cl. 44-68.000.

Cameron, Wallace C., to Copper Alloys Corp. Two-piece hammers for hammer mills. 4,202,504, Cl. 241-194.000.

Cann, Peter L.; Hayes, Richmond S., Jr.; and Miller, Lester N., to Carrier Corporation. One piece top cover with stamped open louvers and motor mount. 4,202,409, Cl. 165-122.000.

Cannon, Curtis W.; and Hall, Robert N., to Climax Chemical Corporation. Process for manufacture of phosphoric acid and phosphorus pentafluoride. 4,202,867, Cl. 423-301.000.

Canon Kabushiki Kaisha: *See*—
Fukuda, Tadaji; Kajita, Isamu; Misumi, Teruo; Kondo, Hideyo; and Kitajima, Nobuo, 4,202,937, Cl. 430-58.000.
Kawatsura, Yoshihiro; Shimizu, Katsuichi; and Sakamaki, Hisashi, 4,202,622, Cl. 355-14.00C.
Suzki, Akiyoshi; Kano, Ichiro; Yoshinari, Hideki; Tozuka, Masao; Hiraga, Ryozo; Kato, Yuzo; and Ogino, Yasuo, 4,202,627, Cl. 356-71.000.
Yoshimura, Shigeru; and Shimizu, Katsuichi, 4,202,621, Cl. 355-14.00R.

Carini, George F., to Clay Harden Company, The. Tundish flux powder. 4,202,692, Cl. 75-257.000.

Carl Freudenberg, Firma: *See*—
Becker, Bernd; Forch, Hans; Helfrich, Adam; and Jung, Gottfried, 4,202,555, Cl. 277-153.000.

Carl Schenck Aktiengesellschaft, Firma: *See*—
Homann, Reimer; and Raptopoulos, Prodromos, 4,203,046, Cl. 310-93.000.

Carlson, Charles E., to Allied Chemical Corporation. Chill roll casting of amorphous metal strip. 4,202,404, Cl. 164-423.000.

Carpenter, David A., to MRC Corporation. Integral torquer for mass measurement system. 4,202,205, Cl. 73-65.000.

Carr, John B.; and Durham, Harry G., to Shell Oil Company. Lipogenesis control by cyclopropane-carboxylic acids, esters and amides. 4,202,902, Cl. 424-298.000.

Carr, John B.: *See*—
Durham, Harry G.; and Carr, John B., 4,202,818, Cl. 548-204.000.

Carrier Corporation: *See*—
Cann, Peter L.; Hayes, Richmond S., Jr.; and Miller, Lester N., 4,202,409, Cl. 165-122.000.

Carroll, Edward E., Jr., to University of Florida Board of Regents. Diffraction camera for imaging penetrating radiation. 4,203,034, Cl. 250-280.000.

Carter, Dorothy P.: *See*—
Jacoby, Lawrence J.; Rosenau, Richard A.; Carter, Dorothy P.; Nielsen, Ralph H.; and Ash, Kenneth C., 4,202,862, Cl. 423-70.000.

Carver Foundry Products: *See*—
Abraham, Edward D.; and Hartung, Rodney L., 4,202,399, Cl. 164-203.000.

Casio Computer Co., Ltd.: *See*—
Kashio, Toshio, 4,202,362, Cl. 133-4.00A.

Castle, Peter M., to Westinghouse Electric Corp. Photopolymerization of ethylenically unsaturated monomers. 4,202,742, Cl. 204-159.230.

Caterpillar Tractor Co.: *See*—
Hooker, James A.; Martin, Dean W.; and Williamson, Shellie O., 4,202,224, Cl. 81-3.00R.

Cavallo, Margherita, to Establissement Chemiaro. Process for manufacturing protein-containing artificial leather. 4,202,919, Cl. 427-245.000.

Ceauselu, Constantin: *See*—
Teodorescu, Constantin; Ceauselu, Constantin; and Ardeleanu, Stefan, 4,202,272, Cl. 104-91.000.

Centerline Steering Safety Axle Corporation, The: *See*—
Inbody, Melvin R., 4,202,560, Cl. 280-96.300.

Ceramic Coating Company: *See*—
Kropp, Donald E., 4,202,553, Cl. 277-41.000.

Chadda, Madan M., to Semikron Gesellschaft fur Gleichrichterbau und Elektronik m.b.H. Surfacing process for the stabilization of semiconductor bodies employing glass containing quartz passivating layer. 4,202,916, Cl. 427-82.000.

Chambers, Derek; and Masterman, Hugh C., to Raytheon Company. High voltage power supply system. 4,203,055, Cl. 315-375.000.

Chambers, Virginia E. M.: *See*—
Bayly, Russell J.; Chambers, Virginia E. M.; and Monks, Reginald, 4,202,976, Cl. 544-261.000.

Champion International Corporation: *See*—
McLaren, Edwin C., 4,202,465, Cl. 220-468.000.
Phelps, Thomas C.; and Reese, Clifford J., 4,202,749, Cl. 204-195.00G.

Champoux, Louis A.; Falcioni, Joseph G.; and Mendels, Morton, to Boeing Company, The. Wedge head pin fastener. 4,202,242, Cl. 85-7.000.

Chandalia, Kiran B.: *See*—
Preston, Frank J.; and Chandalia, Kiran B., 4,202,947, Cl. 521-174.000.

Chang, Eugene Y. C.; and Saxon, Robert, to American Cyanamid Company. Sulfur vulcanizable ethylene-vinyl acetate copolymer elastomers. 4,202,845, Cl. 525-302.000.

Charlan, George B.: *See*—
Chen, Tu; and Charlan, George B., 4,202,932, Cl. 428-667.000.

Charles River Breeding Laboratories, Inc., The: *See*—
Orcutt, Roger P., 4,202,883, Cl. 424-92.000.

Charles Stark Draper Laboratory, Inc., The: *See*—
Bowles, William M.; and Cox, Duncan B., Jr., 4,203,070, Cl. 375-1.000.
Bowles, William M.; Cox, Duncan B., Jr.; and Guinon, Walter J., 4,203,071, Cl. 375-1.000.

Chatterjee, Pallab K.; Taylor, Geoff W.; Tasch, Al F., Jr.; and Fu, Horng-Sen, to Texas Instruments Incorporated. Buried storage punch through dynamic ram cell. 4,203,125, Cl. 357-41.000.

Chaudhuri, Partha S., to Westvaco Corporation. Automatically controlled machine for making double-face, polymer plastic coated, corrugated paperboard. 4,202,723, Cl. 156-470.000.

Chelyabinsky Politekhnichesky Institut: *See*—
Vydrin, Vladimir N.; Dukmasov, Vladimir G.; Davlyatshin, Garifulla; and Kuznetsov, Sergei L., 4,202,197, Cl. 72-245.000.

Chemed Corporation: *See*—
Jacob, Jose T.; and Kuhn, Vincent R., 4,202,796, Cl. 252-389.00A.

Chemworld Corporation: *See*—
Hobbs, James E., 4,202,525, Cl. 251-40.000.

Chen, Cheng-Kuan. Hydraulic jack device. 4,202,514, Cl. 254-93.00H.

Chen, Sow-Mei L.: *See*—
Floyd, Middleton B., Jr.; Weiss, Martin J.; Grudzinskas, Charles V.; and Chen, Sow-Mei L., 4,202,989, Cl. 560-118.000.

Chen, Stephen S., to General Motors Corporation. Failure detection circuit for dynamic braking system. 4,203,058, Cl. 318-380.000.

Chen, Tu; and Charlan, George B., to Xerox Corporation. Magnetic recording medium. 4,202,932, Cl. 428-667.000.

Chernyak, Alexandr I.: *See*—
Latash, Jury V.; Voronin, Alexei E.; Nikolaev, Vladimir A.; Pelts, Boris B.; Volokhonsky, Lev A.; Artemiev, Vladimir D.; Vlasov, Mikhail I.; Chernyak, Alexandr I.; Nikulin, Alexandr A.; Dub, Vladimir S.; Vasiliev, Yakov M.; Stul, Iosif N.; Mukha, Vitaly P.; Orlov, Gennady I.; Khasin, Kim M.; Naryshkin, Jury A.; Belsky, Valentin I; Veligura, Ilya L.; Bogdashich, Vladimir E.; Lisitsin, Vladimir A.; Mischenko, Alexandr V.; Kovalenko, Jury A.; Babin, Vladimir V.; Svitenko, Igor A.; Antonov, Vladimir I.; and Smolyarenko, Volemir D., 4,202,401, Cl. 164-252.000.

Chevron Research Company: *See*—
Adamson, John S., 4,203,090, Cl. 340-152.00T.

Chiba, Iwane: *See*—
Kawasoko, Yoshiaki; Chiba, Iwane; Yamazaki, Noboru; Chiyonobu, Toshimi; and Shikuma, Masao, 4,202,537, Cl. 266-252.000.

Chibnik, Sheldon, to Mobil Oil Corporation. Antioxidant additives and lubricant compositions containing same. 4,202,783, Cl. 252-51.50A.

Chikugo, Kazuo: *See*—
Ohno, Eiji; and Chikugo, Kazuo, 4,202,689, Cl. 75-211.000.

Chiyonobu, Toshimi: *See*—
Kawasoko, Yoshiaki; Chiba, Iwane; Yamazaki, Noboru; Chiyonobu, Toshimi; and Shikuma, Masao, 4,202,537, Cl. 266-252.000.

Chleck, David J.: *See*—
Kovac, Michael G.; Chleck, David J.; and Goodman, Philip, 4,203,087, Cl. 338-35.000.

Christopher, Todd J.; and Lin, Tsan H., to RCA Corporation. FM Signal demodulator with defect detection. 4,203,134, Cl. 358-128.500.

Christy, John: *See*—
Sippel, Nathan J.; Hiser, Earl J.; and Christy, John, 4,202,668, Cl. 44-7.00A.

Chrysler Corporation: *See*—
Kraus, Richard A., 4,203,059, Cl. 318-446.000.

Chubukov, Vladimir K.: *See*—
Shafranovsky, Alexandr V.; Olevsky, Viktor M.; Chubukov, Vladimir K.; Baskov, Jury A.; and Dmitriev, Konstantin V., 4,202,846, Cl. 261-142.000.

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Jan, Gerald; Hagen, Remon; and Lenoir, John, 4,202,698, Cl. 430-418.000.

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Burri, Peter, 4,202,820, Cl. 260-315.000.
Finch, Neville; and Mizzoni, Renat H., 4,202,901, Cl. 424-263.000.
Habermeier, Jurgen; Moser, Roland; and Seiz, Wolfgang, 4,202,987, Cl. 560-49.000.
Kocsis, Karoly; Fechtig, Bruno; and Bickel, Hans, 4,202,900, Cl. 424-251.000.
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Lauton, Alain; Putzar, Roland; Berendt, Hans-Ulrich; and Scherer, Gustaaf, 4,202,838, Cl. 260-505.00C.
Lienhard, Paul; and Iqbal, Abul, 4,202,814, Cl. 260-40.00P.
Moser, Paul; and Rody, Jean, 4,202,816, Cl. 260-45.75N.
Pfeifer, Josef, 4,202,961, Cl. 528-324.000.
Renner, Alfred; and Margotte, Werner, 4,202,920, Cl. 427-386.000.
Tzikas, Athanassios, 4,202,827, Cl. 260-378.000.

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Komiyama, Katsuhiko; Kasama, Noriyuki; Tsukamoto, Keiji; and Murakami, Tomomi, 4,202,166, Cl. 368-82.000.

Claas, Helmut; Romer, Gerhard; and Weddeling, Otger, to Gebr. Claas Maschinenfabrik GmbH. Agricultural baler. 4,202,262, Cl. 100-4.000.

Clairol Incorporated: *See*—
Walter Henry J., 4,202,360, Cl. 132-40.000.
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Clarke, Ralph H.; Clarke, W. James; and Mays, Steven L., 4,202,677, Cl. 55-378.000.

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Carini, George F., 4,202,692, Cl. 75-257.000.
Clayton, Erith T., to Tainton Company, The. Mechanical plating process. 4,202,915, Cl. 427-47.000.
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Clearwaters, Walter L.; Einstein, Lloyd T.; Radics, Paul F., Jr.; and Soderberg, John W., to United States of America, Navy. Electrically steerable spherical hydrophone array. 4,203,162, Cl. 367-122.000.
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Climax Chemical Corporation: *See*—
Cannon, Curtis W.; and Hall, Robert N., 4,202,867, Cl. 423-301.000.
Coal Industry (Patents) Limited: *See*—
Brooks, Brian E., 4,203,010, Cl. 179-82.000.
Cocito, Giuseppe, to CSELT - Centro Studi e Laboratori Telecomunicazioni S.p.A. Process and apparatus for the continuous production of elongate light conductors. 4,202,679, Cl. 65-2.000.
Cohn-Sfetcu, Sorin; Hood, Jackylene K.; and Doyle, Daniel J., to Northern Telecom Limited. Digital signalling receiver for receiving PCM tones. 4,203,008, Cl. 370-50.000.
Coleman, Clyde F.; and Stewart, Myron C., to RCA Corporation. RF Connector assembly including mounting apparatus for a washer-like capacitor. 4,202,594, Cl. 339-147.00R.
Coles, Robert E., to General Foods Limited. Wrapping process. 4,202,152, Cl. 53-451.000.
Colite Industries, Inc.: *See*—
Witt, Frank A., 4,202,123, Cl. 40-596.000.
Collen, Desire J., to Leuven Research & Development V.Z.W. Determination of heparin in blood plasma. 4,202,872, Cl. 424-1.000.
Collins, Andrew P. Recreational basketball court facility. 4,202,543, Cl. 272-3.000.
Coltrin, Michael E.; and Wu, Yulin, to Phillips Petroleum Company. Process for producing hydroperoxides. 4,202,992, Cl. 568-575.000.
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Miller, Charles R., 4,202,403, Cl. 164-409.000.
Comerford, Peter J., to National Research Development Corporation. Digital generator for musical notes. 4,202,234, Cl. 84-1.010.
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Allain, Albert; and Buret, Jacqui, 4,202,728, Cl. 176-30.000.
Allain, Albert; Buret, Jacqui; and Plagnard, Andre, 4,202,729, Cl. 176-30.000.
Bourgeois, Michel; Manevy, Georges; and Roux, Jean-Pierre, 4,202,861, Cl. 423-19.000.
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Massoubre, Jean-Marie, 4,202,954, Cl. 526-181.000.
Compagnie Nationale d'Amenagement de la Region du Bas-Rhone et du Languedoc: *See*—
Rutten, Pierre L.; and Danel, Francois H., 4,202,467, Cl. 222-20.000.
Concast AG: *See*—
Rohrig, Adalbert, 4,202,402, Cl. 164-263.000.
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Hren, John J.; Clark, David E.; Jenkins, David A.; Johnson, Paul F., III; and Degler, Howead E., Jr., 4,202,337, Cl. 128-303.140.
Condon, Denis M., to Siemens Aktiengesellschaft. Apparatus for establishing multi-address and conference call connections. 4,203,001, Cl. 178-3.000.
Conoco, Inc.: *See*—
Peterson, Marvin L., 4,202,484, Cl. 228-173.00A.
Conroy, Edward H.; Gloster, Arthur; and King, James A., to Texasgulf Inc. Process for the separation of insoluble materials in the production of soda ash. 4,202,667, Cl. 23-302.00T.
Conti, Allen C. Method for pulling cable using a tear-away feeder tube. 4,202,530, Cl. 254-134.3FT.
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Khoury, Nick S., 4,202,750, Cl. 204-197.000.
Control Concepts, Inc.: *See*—
Zeuner, Kenneth W.; and Jarman, Alonzo B., 4,202,250, Cl. 91-449.000.
Cook, James S., to Econotherm Insulation Company, Inc. Lined curvilinear support cradle and a method for manufacturing the same. 4,202,090, Cl. 29-417.000.
Cook, John B.; and Pike, Melvin, to Efficiency Production, Inc. Front plate for trench boxes. 4,202,649, Cl. 405-282.000.
Cook, Kenneth, to Henry Simon Limited. Method of and apparatus for dispensing predetermined proportions of two or more materials. 4,202,466, Cl. 222-1.000.
Cooper, Edward M.: *See*—
Jackson, Joseph F.; and Cooper, Edward M., 4,202,488, Cl. 233-24.000.
Cooper-Weymouth, Peterson, Inc.: *See*—
Kula, Bernard, 4,202,478, Cl. 226-189.000.
Copper Alloys Corp.: *See*—
Cameron, Wallace C., 4,202,504, Cl. 241-194.000.
Cordis Dow Corp.: *See*—
Storey, L. Robert; and Hall, Robert C., 4,202,760, Cl. 210-22.00A.
Couch, Richard W., Jr.; and Bailey, William V., to Hypertherm, Incorporated. Method and apparatus for positioning a plasma arc cutting torch. 4,203,022, Cl. 219-121.00P.
Coulter, Alton R.; Hubbard, Lonnie G.; Johnston, Vincent P.; and Rich, Michael H., to Leav-Er-Rite Mfg. Co. Incorporated. Cast-in-place concrete slab pouring form. 4,202,145, Cl. 52-169.100.
Coutin, Pierre F.: *See*—
Hasquenoph, Jean H.; and Coutin, Pierre F., 4,202,576, Cl. 294-83.00R.
Coviello, Frank A., to TIE/Communications, Inc. Computer controlled key telephone station set. 4,203,011, Cl. 179-99.00M.
Cox, Albert R., to Belden Corporation. Strain relief. 4,203,004, Cl. 174-135.000.
Cox, Duncan B., Jr.: *See*—
Bowles, William M.; and Cox, Duncan B., Jr., 4,203,070, Cl. 375-1.000.
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Cox, Frank H., to Scott & Fetzer Company, The. Liquefied gas supply system. 4,202,180, Cl. 62-50.000.
CPC International Inc.: *See*—
Mueller, Nancy J.; and Holik, Dennis J., 4,202,939, Cl. 435-96.000.
Craig, Chester W., Sr.: *See*—
Adams, Daniel, Jr.; and Craig, Chester W., Sr., 4,202,108, Cl. 33-189.000.
Cramer, John J.: *See*—
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Crane, Jacob; Shapiro, Eugene; Shapiro, Stanley; and Mravic, Brian, to Olin Corporation. High conductivity high temperature copper alloy. 4,202,688, Cl. 75-153.000.
Crawford, Lynn D.: *See*—
Watts, Paul J.; Crawford, Lynn D.; and Nichols, Philip T., 4,202,363, Cl. 135-2.000.
Crepaco, Inc.: *See*—
Kristapovich, Paul J.; and Schiltz, Ronald M., 4,202,436, Cl. 198-472.000.
Cripe, Alan R.: *See*—
Browne, Kenneth A.; Cripe, Alan R.; and Hindin, Eugene, 4,202,276, Cl. 105-165.000.
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Cronin, John C., to Gould Inc. Air entrance bushing for gas-insulated bus. 4,202,998, Cl. 174-31.00R.
Csakvary, Tibor; and Fromson, Robert E., to United States of America, Energy. Electrochemical removal of material from metallic work. 4,202,739, Cl. 204-129.350.
CSELT - Centro Studi e Laboratori Telecomunicazioni S.p.A.: *See*—
Cocito, Giuseppe, 4,202,679, Cl. 65-2.000.
D. T. Equipment Limited: *See*—
Held, Ross, 4,202,118, Cl. 37-41.000.
Dabroski, Winifred C., to Johnson & Johnson. Paper surgical tape. 4,202,925, Cl. 428-219.000.
D'Acierno, John P.: *See*—
Feng, Henry H.; D'Acierno, John P.; and Skrzec, Adam E., 4,202,866, Cl. 423-265.000.
Dai, Sheng-Hong A., to Upjohn Company, The. Hydroperoxyisopropylphenyl carbonates. 4,202,833, Cl. 260-463.000.
Daimler-Benz Aktiengesellschaft: *See*—
Breitschwerdt, Werner; Andres, Rudolf; Heiss, Werner; and Fussnegger, Wolfgang, 4,202,577, Cl. 296-24.00R.
Meyer, Franz-Josef, 4,202,170, Cl. 60-39.230.
Tattermusch, Peter, 4,202,563, Cl. 280-675.000.
Dainippon Ink & Chemicals Inc.: *See*—
Sato, Hisato; Takatsu, Haruyoshi; and Tazume, Masayuki, 4,202,791, Cl. 252-299.000.
Dake, James D.: *See*—
Alley, Bernard J.; Dake, James D.; and Dykes, Hiram W. H., 4,202,714, Cl. 149-109.400.
Dalamangas, Chris A.; Piccirillo, Thomas P.; and Seip, Donald P., to Technical Wire Products. Electrical connector and support means therefor. 4,202,588, Cl. 339-59.00M.
Dalisa, Andrew L.; and Singer, Barry M., to North American Philips Corporation. X-Y addressable electrophoretic display device with control electrode. 4,203,106, Cl. 340-787.000.
Danel, Francois H.: *See*—
Rutten, Pierre L.; and Danel, Francois H., 4,202,467, Cl. 222-20.000.
Dangeleit, Siegfried; and Kothe, Dieter, to DEMAG Aktiengesellschaft. Removal apparatus for handling discarded end portions in a multistrand casting plant. 4,202,274, Cl. 104-165.000.
Daniels, R. Gary; Musa, Fuad H.; Wilder, W. Bryant, Jr.; Wiles, Michael F.; and Bennett, Thomas H., to Motorola, Inc. Carry anticipator circuit and method. 4,203,157, Cl. 364-788.000.
Dansbury, Leonard D.: *See*—
Young, Robert W.; and Dansbury, Leonard D., 4,202,517, Cl. 244-3.220.
Dansky, Barry: *See*—
Farella, Ralph; Dansky, Barry; and Epifano, Leonard, 4,202,345, Cl. 128-654.000.
Darnall, Tom A., Jr. Acoustic dampening assembly for record player turntable. 4,202,551, Cl. 274-39.00R.
Dassler, Armin A. Sport shoe tread. 4,202,116, Cl. 36-59.00R.
Datograf Apparatebau GmbH & Co.: *See*—
Mogler, Joachim, 4,202,463, Cl. 220-307.000.
Daugherty, Jack D.; Jacob, Jonah H.; and Mangano, Joseph A., to Avco Everett Research Laboratory, Inc. Apparatus for and method

of operating electron beam attachment stabilized devices for producing controlled discharges and/or visible and UV laser output. 4,203,078, Cl. 331-94.5PE.

Daussan, Andre: *See—*
Daussan, Jean-Charles; Daussan, Gerard; and Daussan, Andre, 4,202,533, Cl. 266-45.000.

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Daussan, Jean-Charles; Daussan, Gerard; and Daussan, Andre, 4,202,533, Cl. 266-45.000.

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Daussan, Jean-Charles; Daussan, Gerard; and Daussan, Andre, to Daussan et Compagnie. Method and a device for unchoking the casting outlet of a metallurgical vessel. 4,202,533, Cl. 266-45.000.

David Brown-Vosper (Offshore) Limited: *See—*
Paddington, Arthur L., 4,202,567, Cl. 285-18.000.

David, Joseph S., to Joy Manufacturing Company. Conveyor. 4,202,442, Cl. 198-820.000.

Davis, C. Paul. Protec 3 cleaning solution. 4,202,787, Cl. 252-171.000.

Davis, Thomas J., to Electric Power Research Institute, Inc. Method and apparatus for non-destructively testing electrically conductive elongate cylindrical components using an eddy current producing coil with a rotor to concentrate the magnetic field in a selected area. 4,203,069, Cl. 324-220.000.

Davis, William L., Jr., to HICAP Engineering & Development Corp. Method and apparatus for producing metallized iron ore. 4,202,534, Cl. 266-172.000.

Davlyatshin, Garifulla: *See—*
Vydrin, Vladimir N.; Dukmasov, Vladimir G.; Davlyatshin, Garifulla; and Kuznetsov, Sergei L., 4,202,197, Cl. 72-245.000.

Davy, Edward, Jr. Dry wall tape dispenser. 4,202,288, Cl. 118-41.000.

Day, John H., to United States of America, Army. Safe and arm device. 4,202,271, Cl. 102-247.000.

Dayco Corporationp: *See—*
Roman, Charles A., 4,202,716, Cl. 156-79.000.

Dayton-Walther Corporation: *See—*
Foster, Alan D., 4,202,528, Cl. 254-86.00R.

de la Burde, Roger Z.; Aument, Patrick E.; and Utsch, Francis V., to Philip Morris Incorporated. Reordering expanded tobacco by water mist. 4,202,357, Cl. 131-140.00R.

DeBell, David A., to Westinghouse Electric Corp. Electro-hydroacoustic transducer. 4,203,089, Cl. 367-143.000.

Deconinck, Marc M.: *See—*
Schnek, Arthur G.; Looze, Yvan-Roger-Jean; and Deconinck, Marc M., 4,202,884, Cl. 424-94.000.

Deere & Company: *See—*
Lob, James P., 4,202,429, Cl. 188-71.100.

Degler, Howead E., Jr.: *See—*
Hren, John J.; Clark, David E.; Jenkins, David A.; Johnson, Paul F., III; and Degler, Howead E., Jr., 4,202,337, Cl. 128-303.140.

Dekker, David J.: *See—*
Heck, Richard A.; and Dekker, David J., 4,202,395, Cl. 160-84.00R.

Del Manufacturing Company: *See—*
Delgado, Manuel M.; and Riise, Harold N., 4,202,322, Cl. 126-425.000.

Delgado, Manuel M.; and Riise, Harold N., to Del Manufacturing Company. Solar energy collector and heat exchanger. 4,202,322, Cl. 126-425.000.

De Longe, Harry C.; and Fabian, Woolfe S., to PepsiCo, Inc. Backwash water recycling system. 4,202,768, Cl. 210-62.000.

Deltrol Corp.: *See—*
Harris, John L., 4,203,014, Cl. 200-38.00R.

DeLuca, Hector F.; Schnoes, Heinrich K.; Hamer, David E.; and Paaren, Herbert E., to Wisconsin Alumni Research Foundation. Process for preparing 1α-hydroxylated compounds. 4,202,829, Cl. 260-397.200.

DEMAG Aktiengesellschaft: *See—*
Dangeleit, Siegfried; and Kothe, Dieter, 4,202,274, Cl. 104-165.000.

Demidowicz, Lech; and Sztuka, Mieczyslaw, to Kombinat Gorniczo-Hutniczy Miedzihuta Miedzi "Legnica". Automated installation for punching and cleaning of converter tuyeres. 4,202,536, Cl. 266-135.000.

Demin, Alexei S.: *See—*
Bukhtiyarov, Ivan D.; An, Viktor B.; Demin, Alexei S.; Farshatov, Marat N.; and Slepchuk, Valery A., 4,202,206, Cl. 73-116.000.

de Montigny, Armand; Toepsch, Hans; and Buchner, Werner, to Bayer Atkiengesellschaft. Production of non-stick coatings. 4,202,929, Cl. 428-452.000.

de Montigny, Armand: *See—*
Moretto, Hans-Heinrich; de Montigny, Armand; Steinberger, Helmut; Sattlegger, Hans; and Larking, Ingrid, 4,202,807, Cl. 260-29.1SB.

den Hartog, Huibert; Stann, Klaus; and Stolze, Lutz, to Hoesch Werke Aktiengesellschaft. Inclined rolling stand. 4,202,194, Cl. 72-78.000.

Denka Chemical Corporation: *See—*
Kerr, Ralph O., 4,202,826, Cl. 260-346.750.

Denzel, Theodor; and Hoehn, Hans, to E. R. Squibb & Sons, Inc. 8H-Pyrazolo[1,5-a]pyrazolo[4',3':5,6]pyrido[3,4-e]pyrimidine. 4,202,899, Cl. 424-251.000.

DeParales, Lawrence T.; and Billitzer, Edward P. Disposable cup cover. 4,202,459, Cl. 220-90.400.

DePodesta, Thomas C.; and Moss, Milton. Heating apparatus. 4,202,318, Cl. 126-110.00R.

Depoortere, Henri, to Synthelabo. Method of treating anxiety and depression. 4,202,898, Cl. 424-250.000.

DeSoto, Inc.: *See—*
Porzel, Rita E.; and Bator, Cathryn D., 4,202,804, Cl. 260-17.40R.

Deuterium Corporation: *See—*
Spevack, Jerome S., 4,202,864, Cl. 423-220.000.

De Winter, Walter F.: *See—*
Van Goethem, Hugo V.; Stroobants, Marcel; and De Winter, Walter F., 4,202,697, Cl. 430-306.000.

De Witt, Walter G., III, to Rohm and Haas Company. High impact resistant coated articles. 4,202,924, Cl. 428-201.000.

Dial-A-Channel, Inc.: *See—*
Doumit, Joseph A.; and Weiblen, Robert E., 4,203,130, Cl. 358-1.000.

Diamond Shamrock Corporation: *See—*
Stillman, Neil W., 4,202,738, Cl. 204-95.000.

Di Bella, Eugene P., to Tenneco Chemicals, Inc. Process for the production of organic phosphates by nitric acid oxidation of organic phosphites. 4,202,843, Cl. 260-985.000.

Di Bella, Eugene P., to Tenneco Chemicals, Inc. Process for the production of organic phosphates. 4,202,844, Cl. 260-985.000.

Dick, John O., to United States of America, Navy. Microwave proximity fuze requiring no warm-up time after being activated. 4,203,110, Cl. 343-7.0PF.

Didier Engineering GmbH: *See—*
Luke, Willy; and Gabriel, Gunter, 4,202,733, Cl. 201-1.000.
Woitowitz, Friedhelm, 4,202,407, Cl. 165-76.000.

Diebold, Incorporated: *See—*
Boyd, James C., 4,203,153, Cl. 364-200.000.

Diehl, Richard C.; and Walker, Jerry L., to Calgon Corporation. Fuel conditioner. 4,202,671, Cl. 44-68.000.

Dietrich, Ernst: *See—*
Hoerauf, Werner; Pirzer, Hans; Guenther, Ernst; Neumann, Eckart; and Dietrich, Ernst, 4,202,375, Cl. 138-39.000.

Digenis, George A.; and Shambhu, Manvendra B., to University of Kentucky Research Foundation. Tobacco smoke filter material. 4,202,356, Cl. 131-10.900.

Di Giuseppe, Michael A.: *See—*
Kokta, Milan R.; Linares, Robert C.; and Di Giuseppe, Michael A., 4,202,930, Cl. 428-539.000.

Dilworth, James L.: *See—*
VanderKelen, James B.; and Dilworth, James L., 4,202,496, Cl. 239-14.000.

Di Matteo, Paul L.; Ross, Joseph A.; Stern, Howard K.; and Waszak, Lawrence, to Solid Photography Inc. Arrangement for sensing the geometric characteristics of an object. 4,202,612, Cl. 353-28.000.

Director-Gen. of the Tea Experiment Station, Ministry of Agriculture and Forestry Japanese Government: *See—*
Misaki, Akira; Takaya, Shigeo; Yokobayashi, Koji; and Tsuburaya, Yoichi, 4,202,940, Cl. 435-101.000.
Misaki, Akira; Takaya, Shigeo; Yokobayashi, Koji; and Tsuburaya, Yoichi, 4,202,966, Cl. 536-1.000.

DiTullio, Flavia, to Hanes Corporation. Method for constructing breast cups. 4,202,853, Cl. 264-138.000.

Dmitriev, Konstantin V.: *See—*
Shafranovsky, Alexandr V.; Olevsky, Viktor M.; Chubukov, Vladimir K.; Baskov, Jury A.; and Dmitriev, Konstantin V., 4,202,846, Cl. 261-142.000.

Dr. E. Fresenius Chem.-Pharm. Industrie KG: *See—*
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Dr. Ing. h.c.F. Porsche Aktiengesellschaft: *See—*
Mezger, Hans, 4,202,176, Cl. 60-600.000.

Dr. Ing. Rudolf Hell GmbH: *See—*
Wellendorf, Klaus; and Sommer, Ruediger, 4,203,136, Cl. 358-280.000.

Doe, Lester A., Jr.; and Brooks, Lester A., to R. T. Vanderbilt Company, Inc. Multifunctional additives for lubricants. 4,202,782, Cl. 252-51.50A.

Doherty, John J., to United States of America, Navy. Submarine communication. 4,203,160, Cl. 367-2.000.

Donnelly, James F.: *See—*
Aoki, Tadashi; MacAfee, Jerry D.; and Donnelly, James F., 4,202,365, Cl. 137-72.000.

Dorr-Oliver Incorporated: *See—*
Kos, Peter, 4,202,774, Cl. 210-274.000.
Schall, Robert A., 4,202,777, Cl. 210-405.000.

Doryokuro Kakunenryo Kaihatsu Jigyodan: *See—*
Yagisawa, Hideji, 4,202,202, Cl. 73-40.000.

Doumit, Joseph A.; and Weiblen, Robert E., to Dial-A-Channel, Inc. Information displaying system. 4,203,130, Cl. 358-1.000.

Dow Chemical Company, The: *See—*
Eash, R. Douglas, 4,202,809, Cl. 260-29.70S.
Exner, Jurgen H.; and Henke, Cyril B., 4,202,745, Cl. 204-180.00R.

Dow Corning Corporation: *See—*
Michael, Keith W.; and Moore, Alvin L., 4,202,811, Cl. 260-37.0SB.
Murray, Milton C., 4,202,812, Cl. 260-37.0SB.

Dow Corning GmbH: *See—*
Brendle, Marcel C., 4,202,780, Cl. 252-12.000.

Dowbenko, Rostyslaw, to PPG Industries, Inc. Polymer curing system. 4,202,926, Cl. 428-304.000.

Doyle, Daniel J.: *See—*
Cohn-Sfetcu, Sorin; Hood, Jackylene K.; and Doyle, Daniel J., 4,203,008, Cl. 370-50.000.

Dragone, Corrado; and Gans, Michael J., to Bell Telephone Laboratories, Incorporated. Scanable antenna arrangements capable of producing a large image of a small array with minimal aberrations. 4,203,105, Cl. 343-781.00P.

Drapaniotis, Dimitrios. Filter for cigarettes with two chambers. 4,202,358, Cl. 131-187.000.
Dresser Europe S.A.: *See—*
Parkinson, Derek; and Goose, Jack, 4,202,503, Cl. 241-194.000.
Dresser Industries, Inc.: *See—*
Youngblood, Thomas F., 4,202,419, Cl. 175-374.000.
Dreyer, Heinz, to Amazonen-Werke. Machine for spreading fertilizer and seed. 4,202,474, Cl. 222-609.000.
Dub, Vladimir S.: *See—*
Latash, Jury V.; Voronin, Alexei E.; Nikolaev, Vladimir A.; Pelts, Boris B.; Volokhonsky, Lev A.; Artemiev, Vladimir D.; Vlasov, Mikhail I.; Chernyak, Alexandr I.; Nikulin, Alexandr A.; Dub, Vladimir S.; Vasiliev, Yakov M.; Stul, Iosif N.; Mukha, Vitaly P.; Orlov, Gennady I.; Khasin, Kim M.; Naryshkin, Jury A.; Belsky, Valentin I; Veligura, Ilya L.; Bogdashich, Vladimir E.; Lisitsin, Vladimir A.; Mischenko, Alexandr V.; Kovalenko, Jury A.; Babin, Vladimir V.; Svitenko, Igor A.; Antonov, Vladimir I.; and Smolyarenko, Volemir D., 4,202,401, Cl. 164-252.000.
Dufaylite Developments Limited: *See—*
Thwaites, Peter John, 4,202,253, Cl. 93-1.00H.
Duffill, Colin: *See—*
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Pruckmayr, Gerfried; and Robinson, Ivan M., 4,202,964, Cl. 528-482.000.
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Carr, John B.; and Durham, Harry G., 4,202,902, Cl. 424-298.000.
Durselen, Heinz; Onnebrink, Franz-Josef; and Schuffler, Arnulf, to Krupp-Koppers GmbH. Process for operating coking ovens and an oven for use in said process. 4,202,735, Cl. 201-41.000.
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Farley, Max F.; and Dutton, Edmund L., 4,203,096, Cl. 340-538.000.
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Dykes, Hiram W. H.: *See—*
Alley, Bernard J.; Dake, James D.; and Dykes, Hiram W. H., 4,202,714, Cl. 149-109.400.
Dyna Con Packaging Inc.: *See—*
Fremion, Edwin A., 4,202,485, Cl. 229-22.000.
Dzus Fastener Co., Inc.: *See—*
Schenk, Peter, 4,202,390, Cl. 151-41.750.
E. R. Squibb & Sons, Inc.: *See—*
Denzel, Theodor; and Hoehn, Hans, 4,202,899, Cl. 424-251.000.
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E-Systems, Inc.: *See—*
Holmes, Lloyd H., 4,202,209, Cl. 73-168.000.
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Tansi, Hakki M., 4,202,457, Cl. 220-3.300.
Early, Jack; Mooney, John J.; and Keith, Carl D., to Engelhard Minerals & Chemicals Corporation. Oxygen sensor control system. 4,202,301, Cl. 123-119.0EC.
Eash, R. Douglas, to Dow Chemical Company, The. Styrene-butadiene-acrylonitrile interpolymer latex based cement additives. 4,202,809, Cl. 260-29.70S.
Eastman Kodak Company: *See—*
Harvey, Donald M., 4,202,614, Cl. 354-121.000.
Merrill, Stewart H.; Hartman, Susan E.; Noonan, John M.; Sandhu, Mohammad A.; and Santilli, Domenic, 4,202,785, Cl. 430-106.000.
Zannucci, Joseph S.; and Thompson, John W., 4,202,788, Cl. 252-182.000.
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Buchanan, Lloyd W.; Eberhart, Noah E.; and Szabo, Arthur D., 4,203,045, Cl. 310-68.00C.
Ebling, Wendell V.: *See—*
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Eckert, Theodor; Kemper, Fritz H.; Wischniewski, Martin; and Hempel, Reinhard, to Kali-Chemie Pharma GmbH. Readily enterally absorbable pharmaceutical compositions of cardiac glycosides and preparation thereof. 4,202,888, Cl. 424-182.000.
Econotherm Insulation Company, Inc.: *See—*
Cook, James S., 4,202,090, Cl. 29-417.000.
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Edwards, John R., to Beckman Instruments, Inc. Lipoprotein rotor lid. 4,202,487, Cl. 233-1.00A.
Edwards, John W. Crop harvesting apparatus. 4,202,158, Cl. 56-328.00R.
Edwards, Jon L., to Texas Instruments Incorporated. Solid state keyswitch arrangement. 4,203,093, Cl. 340-365.00L.
Edwards, Raymond A., to Elser Farms Corporation. Sensor for soft drink dispenser. 4,203,099, Cl. 340-619.000.
Efficiency Production, Inc.: *See—*
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Egashira, Tsutomu: *See—*
Imataki, Mitsumasa; Ujita, Katsu; and Egashira, Tsutomu, 4,203,143, Cl. 361-120.000.
Eglowstein, Ira; and Solender, Peter E., to Eglowstein, Ira. Controlling the operation of numbering machines. 4,202,265, Cl. 101-72.000.
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Hall, Randall C.; and Ehrlich, Burney J., 4,202,666, Cl. 23-232.00E.
Ehrsam, William F.; Elander, Robert C.; Matyas, Stephen M.; Meyer, Carl H. W.; Sahulka, Richard J.; and Tuchman, Walter L., to International Business Machines Corporation. Cryptographic file security for multiple domain networks. 4,203,166, Cl. 375-2.000.
Einstein, Lloyd T.: *See—*
Clearwaters, Walter L.; Einstein, Lloyd T.; Radics, Paul F., Jr.; and Soderberg, John W., 4,203,162, Cl. 367-122.000.
Eknayan, Hrant. Underwater detection system. 4,203,108, Cl. 340-850.000.
Elander, Robert C.: *See—*
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Eli Lilly and Company: *See—*
Kornfeld, Edmund C.; and Bach, Nicholas J., 4,202,979, Cl. 546-67.000.
Shields, James E., 4,202,802, Cl. 260-8.000.
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Villari, Frank K.; Ellmann, Norbert W.; and Annis, Larry D., 4,202,325, Cl. 128-24.00R.
Ellson, Allan H., to Pye (Electronic Products) Limited. Apparatus for detecting explosive substances. 4,202,200, Cl. 73-23.000.
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Burnham, John W.; Briscoe, James E.; and Elphingstone, Eugene A., 4,202,795, Cl. 252-332.000.
Elsasser, Walter; and Hofmann, Werner, to Robert Bosch GmbH. Induction coil core. 4,203,085, Cl. 336-210.000.
Elser, Dieter: *See—*
Jablonsky, Erich; and Elser, Dieter, 4,202,249, Cl. 91-422.000.
Elser Farms Corporation: *See—*
Edwards, Raymond A., 4,203,099, Cl. 340-619.000.
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Emerson Electric Co.: *See—*
Hargraves, David P.; Pauli, Jude A.; and Williams, Steven E., 4,202,373, Cl. 137-625.290.
Mang, Josef; and Waters, Robert W., 4,202,435, Cl. 198-339.000.
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Early, Jack; Mooney, John J.; and Keith, Carl D., 4,202,301, Cl. 123-119.0EC.
Enghag, Per, to Aktiebolaget Garphytte Bruk. Process for the preparation of rope and spring wire of carbon steel with an improved corrosion resistance. 4,202,921, Cl. 427-406.000.
Engvad, Jens C.: *See—*
Madsen, Rud F.; Jensen, Jens H.; and Engvad, Jens C., 4,202,859, Cl. 422-245.000.
Enokido, Nobuo: *See—*
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Entreprise Generale de Chauffage Industriel Pillard: *See—*
Pillard, Jean-Claude L., 4,202,281, Cl. 110-259.000.
Envirotech Corporation: *See—*
Honacker, Horst, 4,202,675, Cl. 55-118.000.
Epifano, Leonard: *See—*
Farella, Ralph; Dansky, Barry; and Epifano, Leonard, 4,202,345, Cl. 128-654.000.
Erbe Elektromedizin KG: *See—*
van Gerven, Hans, 4,202,336, Cl. 128-303.100.
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Johnson, Marvin F. L.; and Erickson, Henry, 4,202,798, Cl. 252-437.000.
Erickson, Robert A., to Kennametal Inc. Shim lock toolholder. 4,202,650, Cl. 407-46.000.

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Erlich-Deguemp, Jean-Antoine. Process and device for retaining a prosthetic element on an osseous part. 4,202,097, Cl. 433-189.000.

Ernst, Gunter; Baer, Edmund; and Wurz, Dieter, to Ernst, Gunter. Apparatus and method for cooling cooling water especially in cooling towers. 4,202,847, Cl. 261-161.000.

Erowa AG: *See*—
Schneider, Rudolf, 4,203,018, Cl. 219-69.00V.

Ershova, Vera A.: *See*—
Nesmeyanov, Alexandr N.; Rogozhin, Sergei V.; Tolstoguzov, Vladimir B.; Misjurev, Vladimir I.; Ershova, Vera A.; and Braudo, Evgeny E., 4,202,908, Cl. 426-72.000.

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Sowa, Kunihiro; and Esaki, Motoharu, 4,203,094, Cl. 340-378.500.

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Cavallo, Margherita, 4,202,919, Cl. 427-245.000.

Eutectic Corporation: *See*—
Yurasko, George, Jr., 4,202,691, Cl. 75-252.000.

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Nixdorf, Hans W.; and Tolle, Gunther, 4,202,069, Cl. 15-250.030.

Ewald, Jerome T., to Bendix Corporation, The. Rotary valve. 4,202,248, Cl. 91-375.00A.

Ewald, Marguerite. Air conditioner cover assembly. 4,202,389, Cl. 150-52.00R.

Exner, Jurgen H.; and Henke, Cyril B., to Dow Chemical Company, The. Method for treating a desizing waste stream. 4,202,745, Cl. 204-180.00R.

Exxon Research & Engineering Co.: *See*—
Baker, Richard H., 4,203,151, Cl. 363-43.000.
Kamvachirapitag, Bhinyo, 4,202,366, Cl. 137-172.000.
Pan, Yen-Chi; and Batzold, John S., 4,202,744, Cl. 204-129.000.
Rello, Michael J., 4,202,639, Cl. 400-171.000.

Fabian, Woolfe S.: *See*—
De Longe, Harry C.; and Fabian, Woolfe S., 4,202,768, Cl. 210-62.000.

Facchini, Alessandro: *See*—
Bezzi, Giovanni; Facchini, Alessandro; Martignani, Giovanni; and Pastore, Michele, 4,202,793, Cl. 252-301.10S.

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Batjukov, Vladimir I.; Vijugov, Oleg N.; Fadeev, Alexandr I.; Shapkin, Alexandr F.; and Dyatlov, Lev E., 4,202,727, Cl. 176-30.000.

Fahrenholtz, Kenneth E.; Guthrie, Robert W.; Kierstead, Richard W.; and Tilley, Jefferson W., to Hoffmann-La Roche Inc. (S)-1-[2-(4-(2-Hydroxy-s-(1-alkylaminopropoxy)phenylalkyl]-4-phenylpiperazines. 4,202,978, Cl. 544-393.000.

Falcioni, Joseph G.: *See*—
Champoux, Louis A.; Falcioni, Joseph G.; and Mendels, Morton, 4,202,242, Cl. 85-7.000.

Fan, You-Ling, to Union Carbide Corporation. Vinyl resin latex coating compositions. 4,202,808, Cl. 260-29.6WB.

Faragher, Raymond F., Jr. Reversible shower curtain. 4,202,059, Cl. 4-149.000.

Farella, Ralph; Dansky, Barry; and Epifano, Leonard, to Medi-Ray, Inc. Apparatus for delivering and receiving radioactive gas. 4,202,345, Cl. 128-654.000.

Farley, Max F.; and Dutton, Edmund L., to Mallinckrodt, Inc. Sensor monitoring alarm system. 4,203,096, Cl. 340-538.000.

Farshatov, Marat N.: *See*—
Bukhtiyarov, Ivan D.; An, Viktor B.; Demin, Alexei S.; Farshatov, Marat N.; and Slepchuk, Valery A., 4,202,206, Cl. 73-116.000.

Faulstich, George W., to Three Sisters Ranch Enterprises. Molded plastic container for use with a cap having inner and outer skirts. 4,202,455, Cl. 215-31.000.

Fechtig, Bruno: *See*—
Kocsis, Karoly; Fechtig, Bruno; and Bickel, Hans, 4,202,900, Cl. 424-251.000.

Federal Paper Board Company, Inc.: *See*—
Sutherland, Robert L., 4,202,446, Cl. 206-147.000.

Fegley, Charles R. Fluid dispensing anti-burglar booby trap device. 4,202,471, Cl. 222-153.000.

Feinmechanische Werke Mainz GmbH: *See*—
Scheufler, Bernd; and Muller, Heinz, 4,202,252, Cl. 91-483.000.

Feldkamper, Richard, to Windmoller & Holscher. Apparatus for transversely severing or transversely perforating webs of material. 4,202,229, Cl. 83-304.000.

Felten & Guilleaume Carlswerk AG: *See*—
Brumann, Joachim, 4,203,028, Cl. 219-384.000.

Feng, Chi Shun: *See*—
Wenz, Barry; Karmen, Arthur; and Feng, Chi Shun, 4,202,665, Cl. 23-230.00B.

Feng, Henry H.; D'Acierno, John P.; and Skrzec, Adam E., to Stauffer Chemical Company. Production of stable vanadium tetrachloride. 4,202,866, Cl. 423-265.000.

Fennell Corporation: *See*—
James, William L.; and Wonso, Alex P., 4,202,918, Cl. 427-224.000.

Fenton, Dennis M.: *See*—
Kita, Donald A.; Gagne, John W.; and Fenton, Dennis M., 4,202,942, Cl. 435-262.000.

Ferro Corporation: *See*—
Nuss, James W., 4,202,702, Cl. 106-288.00B.

Fildes, Francis J. T.; and Hutchinson, Francis G., to Imperial Chemical Industries Limited. Delivery means for biologically active agents comprising hydrophilic polyurethane. 4,202,880, Cl. 424-78.000.

Finch, Neville; and Mizzoni, Renat H., to Ciba-Geigy Corporation. 2-Pyridinecarbonitrile compounds. 4,202,901, Cl. 424-263.000.

Finch, Theron R.: *See*—
Klavan, Irving L.; Calabrese, Peter J.; Finch, Theron R.; Greenberg, Arthur; and McElroy, Robert P., 4,202,620, Cl. 355-10.000.
Klavan, Irving L.; Calabrese, Peter J.; Finch, Theron R.; Greenberg, Arthur; and McElroy, Robert P., 4,202,913, Cl. 430-106.000.

Fink, Eugen; and Ostermeyer, Peter, to Krauss-Maffei Aktiengesellschaft. Apparatus for the dewatering of sludge. 4,202,773, Cl. 210-256.000.

Fink, Raymond: *See*—
Pelosi, Michael H., Jr.; and Fink, Raymond, 4,202,676, Cl. 55-269.000.

Fischer, Artur. Hollow structural element. 4,202,132, Cl. 46-16.000.

Fischer, Howard J.: *See*—
Radebaugh, Bruce A.; O'Connor, Paul J.; and Fischer, Howard J., 4,202,701, Cl. 106-278.000.

Fischer, Ulf; and Kaiser, Ado, to Hoffmann-La Roche Inc. Thiocarbamoylthio fatty acids. 4,202,832, Cl. 260-455.00A.

Fisher, Don E., to Monsanto Company. Chuck assembly. 4,202,507, Cl. 242-46.200.

Fisher & Paykel Limited: *See*—
O'Hare, David H.; Brickell, Christopher G.; and Spilman, Lindsay G., 4,203,027, Cl. 219-275.000.

Fitting, William L., to Fitting, William L.; and Bostrom, David A. Small vehicle lift. 4,202,529, Cl. 254-89.00H.

Fitzky, Hans G.; Schmitt, Franz; Bollongino, Norbert; and Rehrmann, Helmut, to Bayer Aktiengesellschaft. Apparatus for determining the water content of isotropic materials by means of microwave absorption. 4,203,067, Cl. 324-58.50C.

Fleishman, Gregg. Support means for portable furniture. 4,202,581, Cl. 297-440.000.

Fletcher, John J., to Boeing Company, The. Airfoil leading edge slat apparatus. 4,202,519, Cl. 244-214.000.

Flexi Group, Inc., The: *See*—
Bromberg, Howard M., 4,202,546, Cl. 273-93.00R.

Flinders University of South Australia, The: *See*—
Whitford, Darryl R., 4,203,065, Cl. 320-43.000.

Floyd, Middleton B., Jr.; Weiss, Martin J.; Grudzinskas, Charles V.; and Chen, Sow-Mei L., to American Cyanamid Company. 15-Deoxy-16-hydroxy-16-substituted prostanoic acids and congeners. 4,202,989, Cl. 560-118.000.

FMC Corporation: *See*—
Brubaker, Gaylen R., 4,202,786, Cl. 252-102.000.
Gibbons, Harold M., 4,202,372, Cl. 137-615.000.

Focke, Heinz; and Liedtke, Kurt, to Focke & Pfuhl. Apparatus for producing cigarette packs. 4,202,151, Cl. 53-378.000.

Focke & Pfuhl: *See*—
Focke, Heinz; and Liedtke, Kurt, 4,202,151, Cl. 53-378.000.

Foil, Martin B., Jr., to Tuscarora Yarns, Inc. Apparatus for producing novelty yarn. 4,202,161, Cl. 57-12.000.

Fontein, Freerk J.; and Jennekens, Hubertus F., to Stamicarbon, B.V. Process and device for the aeration of waste water. 4,202,762, Cl. 210-3.000.

Forch, Hans: *See*—
Becker, Bernd; Forch, Hans; Helfrich, Adam; and Jung, Gottfried, 4,202,555, Cl. 277-153.000.

Forsell, Bror I., to RP Rorprodukter AB. Closing cap on well casings in well openings. 4,202,376, Cl. 138-89.000.

Forster, Rolf, to Bernhard Forster, Firma. Orthodontic appliance. 4,202,100, Cl. 433-7.000.

Foster, Alan D., to Dayton-Walther Corporation. Coupler and jack assembly. 4,202,528, Cl. 254-86.00R.

Foulquier-Gazagnes, Andre: *See*—
Boucher, Robert; and Foulquier-Gazagnes, Andre, 4,202,662, Cl. 8-444.000.

Foxman, Herbert: *See*—
Zuber, John R.; and Foxman, Herbert, 4,202,703, Cl. 134-2.000.

Frahme, Carl E.; and Wygant, Gary E., to Industrial Insulations, Inc. Method of making thick-walled refractory fiber modules and the product formed thereby. 4,202,148, Cl. 52-592.000.

France Bed Co., Ltd.: *See*—
Masuda, Teruo; Watanabe, Nobuhiko; Abe, Takeo; Koike, Matsuhiro; Morita, Masayasu; Oguma, Yoshio; Hamaguchi, Yoshiharu; Hirata, Motonobu; Saito, Mamoru; Onoguchi, Kunio; Yamaguchi, Kazuyuki; and Hirose, Akira, 4,202,257, Cl. 99-348.000.
Masuda, Teruo; and Morita, Masayasu, 4,202,258, Cl. 99-348.000.

Franchina, Antonino. Heating system having solar assist. 4,202,493, Cl. 237-2.00B.

Freire Costas, Alfonso, to Industrias P. Freire, S.A. Universal thread cutting device and complementary devices applicable to sewing machines. 4,202,286, Cl. 112-286.000.

Fremion, Edwin A., to Dyna Con Packaging Inc. Container and blank therefor. 4,202,485, Cl. 229-22.000.

Fricke, Roy A. Two way spark plug cleaner and method. 4,202,141, Cl. 51-412.000.

Fried. Krupp Gesellschaft mit beschrankter Haftung: *See*—
Pinck, Klaus, 4,202,421, Cl. 175-410.000.

Frikken, Bert R.; and Halcomb, Ronald G., to Rockwell International Corporation. Graphite-epoxy molding method. 4,202,856, Cl. 264-221.000.

Frohlich, Michael; and Stahle, Walter, to Robert Bosch GmbH. Gear coupling. 4,202,183, Cl. 64-1.00C.

Frohman-Bentchkowsky, Dov; Mar, Jerry; Perlegos, George; and Johnson, William S., to Intel Corporation. Electrically programmable and erasable MOS floating gate memory device employing tunneling and method of fabricating same. 4,203,158, Cl. 365-185.000.

Fromson, Robert E.: *See—*
Csakvary, Tibor; and Fromson, Robert E., 4,202,739, Cl. 204-129.350.

Frost, Albert C.: *See—*
Weber, Willis W.; Caglione, Alexander J.; Frost, Albert C.; and Weeks, Thomas J., Jr., 4,202,870, Cl. 423-630.000.

Fu, Horng-Sen: *See—*
Chatterjee, Pallab K.; Taylor, Geoff W.; Tasch, Al F., Jr.; and Fu, Horng-Sen, 4,203,125, Cl. 357-41.000.

Fuji Photo Film Co., Ltd.: *See—*
Obinata, Akira, 4,202,230, Cl. 83-345.000.
Yamaguchi, Nobutaka; Takayama, Satoru; and Fujiyama, Masaki, 4,202,927, Cl. 428-323.000.

Fuji Photo Optical Co., Ltd.: *See—*
Suzuki, Masane; and Suzuki, Kiyoshi, 4,202,630, Cl. 356-371.000.

Fujii, Etsuo: *See—*
Sato, Makoto; Takamatsu, Hiroshi; Miyagawa, Yoshitaka; and Fujii, Etsuo, 4,202,584, Cl. 303-105.000.

Fujii, Minoru. Pressurized dispensers for dispensing products utilizing a pressure transfer fluid. 4,202,470, Cl. 222-130.000.

Fujii, Takayoshi: *See—*
Ueno, Saburo; Yoshikumi, Chikao; Hirose, Fumio; Omura, Yoshio; Wada, Toshihiko; Fujii, Takayoshi; and Takahashi, Eiichi, 4,202,969, Cl. 536-1.000.

Fujita, Hinonori: *See—*
Komatsu, Noboru; Arai, Tohru; and Fujita, Hinonori, 4,202,705, Cl. 148-6.110.

Fujiyama, Masaki: *See—*
Yamaguchi, Nobutaka; Takayama, Satoru; and Fujiyama, Masaki, 4,202,927, Cl. 428-323.000.

Fukai, Kiyoshi: *See—*
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Fukuda, Kenji: *See—*
Murakami, Hisashi; Ohtsubo, Toshikatsu; Fukuda, Kenji; and Ohnishi, Noriaki, 4,202,756, Cl. 208-8.0LE.

Fukuda, Tadaji; Kajita, Isamu; Misumi, Teruo; Kondo, Hideyo; and Kitajima, Nobuo, to Canon Kabushiki Kaisha. Electrophotographic photosensitive member having no fatigue effect. 4,202,937, Cl. 430-58.000.

Fukuda, Takeo; and Murayama, Hideaki, to Tokyo Shibaura Denki Kabushiki Kaisha. Digital type telephone system having a conference function. 4,203,005, Cl. 179-1.0CN.

Fukumi, Hirokazu: *See—*
Kominami, Naoya; Fukumi, Hirokazu; Yamawaki, Naokuni; and Nomura, Junji, 4,202,291, Cl. 119-3.000.

Fukumura, Kunimitsu: *See—*
Ono, Hiroshi; Saida, Toyoyasu; and Fukumura, Kunimitsu, 4,202,766, Cl. 210-40.000.

Fukuzuka, Toshio; Shimogori, Kazutoshi; Satoh, Hiroshi; Kamikubo, Fumio; and Hara, Tatsuo, to Kobe Steel, Ltd. Sacrificial anode and apparatus employing same for treating hot sea water. 4,202,751, Cl. 204-197.000.

Funke, Peter, to Alkem GmbH. Setting and controlling desired redox potentials in gases. 4,202,690, Cl. 75-224.000.

Furst, Andor; Keller, Peter; and Muller, Marcel, to Hoffmann-La Roche Inc. D-Homopregnanes. 4,202,823, Cl. 260-343.600.

Furst, Andor: *See—*
Alig, Leo; Furst, Andor; Muller, Marcel; Kerb, Ulrich; Kieslich, Klaus; and Wiechert, Rudolf, 4,202,841, Cl. 424-311.000.

Furukawa Aluminum Co., Ltd.: *See—*
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Furukawa Electric Co., Ltd., The: *See—*
Matsui, Kazumi; Takasue, Takashi; and Iwasaki, Masami, 4,202,273, Cl. 104-298.000.

Furukawa Metals Co. Ltd.: *See—*
Osugi, Kozo, 4,202,398, Cl. 164-150.000.

Furukawa, Yoshiyasu: *See—*
Marumoto, Ryuji; Furukawa, Yoshiyasu; and Kawai, Kiyohisa, 4,202,975, Cl. 544-255.000.

Fussnegger, Wolfgang: *See—*
Breitschwerdt, Werner; Andres, Rudolf; Heiss, Werner; and Fussnegger, Wolfgang, 4,202,577, Cl. 296-24.00R.

Future Research, Inc.: *See—*
Amendola, Steven C., 4,202,757, Cl. 208-10.000.

G. & S. Allgood (Holdings) Limited: *See—*
Bates, Laurence H. J., 4,202,575, Cl. 292-347.000.

Gabr, Saad Z. M., to A.R.D. Anstalt. Electrostatic shielding assembly for mounting electric circuit boards. 4,203,147, Cl. 361-386.000.

Gabriel, Gunter: *See—*
Luke, Willy; and Gabriel, Gunter, 4,202,733, Cl. 201-1.000.

GAF Corporation: *See—*
Gruber, Bruce A.; and Lorenz, Donald H., 4,202,834, Cl. 260-465.00D.
Gruber, Bruce A.; and Lorenz, Donald H., 4,202,836, Cl. 260-465.400.
Schneider, Louis; and Graham, David E., 4,202,821, Cl. 260-326.50S.

Gagne, John W.: *See—*
Kita, Donald A.; Gagne, John W.; and Fenton, Dennis M., 4,202,942, Cl. 435-262.000.

Gale, Glen R.; and Schwartz, Paul, to United States of America, Health, Education and Welfare. 4-Carboxy-phthalato(1,2-diaminocyclohexane)-platinum(II) and alkali metal salts thereof with cyclophosphamide and hydroxyurea in alleviating L1210 murine leukemia. 4,202,890, Cl. 424-200.000.

Galileo Electro-Optics Corporation: *See—*
Tosswill, Christopher H., 4,202,599, Cl. 350-96.250.

Galperin, Alexandr L.; Serebryannikov, Albert S.; Onikov, Eduard A.; Zabotin, Alexandr A.; Loschilin, Evgeny D.; and Santucci, Nicola. Apparatus for winding a weft thread onto spools of carriers in travelling-wave looms. 4,202,383, Cl. 139-436.000.

Gans, Michael J.: *See—*
Dragone, Corrado; and Gans, Michael J., 4,203,105, Cl. 343-781.00P.

Gappa, Gunther; Juntgen, Harald; and Klein, Jurgen, to Bergwerksverband GmbH. Apparatus for purification of waste water by means of active carbon. 4,202,770, Cl. 210-96.100.

Garrett, Donald E. Energy production for complex geothermal waters. 4,202,177, Cl. 60-641.000.

Garst, John M., to Owens-Corning Fiberglas Corporation. Apparatus and method for changing products on a continuous fibrous glass production line. 4,203,155, Cl. 364-473.000.

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Knowlton, Ted M., 4,202,673, Cl. 48-86.00R.

Gass, Ernst, to Waters Manufacturing, Inc. Potentiometer circuit. 4,203,074, Cl. 308-181.000.

Gauss, Walter: *See—*
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Gaylord, Norman G., to Borg-Warner Corporation. Copolymers of cyclic conjugated dienes and maleic anhydride. 4,202,955, Cl. 526-272.000.

Gebr. Claas Maschinenfabrik GmbH: *See—*
Claas, Helmut; Romer, Gerhard; and Weddeling, Otger, 4,202,262, Cl. 100-4.000.

Gebr. Happich GmbH: *See—*
Viertel, Lothar; Mahler, Gert; and Nowak, Manfred, 4,203,149, Cl. 362-144.000.

Geirnaert, Marcel, to S.E.C.A. Societe Anonyme Societe d'Entreprises Commerciales et Aeronautiques. Generator for flow rate of pressurized fluid. 4,202,251, Cl. 91-472.000.

General Atomic Company: *See—*
Miertschin, Gary N.; and Powell, Kenneth F., 4,202,849, Cl. 264-0.500.

General Dynamics Pomona Division: *See—*
Schertz, Charles W.; and Ritter, Edward H., 4,202,246, Cl. 89-41.0EA.

General Electric Company: *See—*
Gigliotti, Michael F. X., Jr.; and Sawyer, Thomas F., 4,202,400, Cl. 164-251.000.
Holle, Robert F.; and Hansler, Richard L., 4,202,999, Cl. 174-50.610.
Sabatella, Robert J.; M'Sadoques, Andre J.; and Rich, Joseph F., 4,203,146, Cl. 361-361.000.
Takekoshi, Tohru, 4,202,993, Cl. 568-723.000.

General Foods Limited: *See—*
Coles, Robert E., 4,202,152, Cl. 53-451.000.

General Motors Corporation: *See—*
Chen, Stephen S., 4,203,058, Cl. 318-380.000.
Johnson, Gary W.; and Robinson, Carl J., 4,202,207, Cl. 73-119.00A.
Pritchard, Gary E., 4,203,039, Cl. 307-10.00R.
Tuchscherer, Lawrence D., 4,203,015, Cl. 200-61.45R.

Geode Industries, Inc.: *See—*
Smith, Edward E., 4,202,138, Cl. 51-229.000.

Geomet, Incorporated: *See—*
Allen, Richard T.; Moyer, Rudolph H.; Sibbett, Donald J.; Anderson, Howard H.; Martner, Glen R.; and Willis, Don, 4,202,212, Cl. 73-421.50R.

Gerking, Luder; Stahlmann, Dirk; Rothert, Horst; and Karasiak, Wolf, to Karl Fischer, Apparate-und Rohrleitungsbau. Method of producing continuous multifilament yarns. 4,202,855, Cl. 264-210.200.

Gershman, Russell J.: *See—*
Weiner, Irving L.; and Gershman, Russell J., 4,202,625, Cl. 356-39.000.

Gerst, Carl W.; Hair, Hugh A.; and Rehnmark, Stig L., to Anaren Microwave, Inc. Digital bearing indicator. 4,203,114, Cl. 343-100.0SA.

Gesellschaft fur Kernforschung m.b.H.: *See—*
Kaufmann, Friedrich; Weisenburger, Siegfried; Koschorke, Herbert; Seiffert, Hartmut; Sienel, Dieter; and Weiss, Karl-Heinz, 4,202,792, Cl. 252-301.10W.

Ghys, Theofiel H.: *See—*
Philippaerts, Herman A.; Pollet, Robert J.; Muller-Bardorff, Wolfgang; Saleck, Wilhelm; von Konig, Anita; Gauss, Walter; Moll, Franz; and Ghys, Theofiel H., 4,202,695, Cl. 430-8.000.

Gibbons, Harold M., to FMC Corporation. Articulated fluid conduit with auxiliary support. 4,202,372, Cl. 137-615.000.

Giebler, Fritz: *See—*
Heinzl, Joachim; Kern, Hans; and Giebler, Fritz, 4,202,267, Cl. 101-364.000.

Gigliotti, Michael F. X., Jr.; and Sawyer, Thomas F., to General Electric Company. Directional solidification furnace. 4,202,400, Cl. 164-251.000.

Gillette Company, The: *See—*
Sokol, Phillip E., 4,202,652, Cl. 401-196.000.

Gilmer, William N.: *See—*
Suggitt, Robert M.; Gilmer, William N.; and Richter, George N., 4,202,167, Cl. 60-39.020.

Gimelfarb, Natan M.; Lugovnev, Fedor T.; and Misjura, Nikolai E. Method for cleansing cattle hides and apparatus for realizing same. 4,202,664, Cl. 8-94.150.

Gingras, Hilaire. Steak knife. 4,202,095, Cl. 30-340.000.

Giovannetti, Fiorello. Readily releasable clamping connector. 4,202,645, Cl. 403-407.000.

Gist-Brocades N.V.: *See—*
Gootjes, Johan, 4,202,896, Cl. 424-250.000.

Giuliani, Pierre: *See—*
Rabilloud, Guy; Masson, Bernard; Giuliani, Pierre; and Sillion, Bernard, 4,202,960, Cl. 528-271.000.

Glancy, John J. Dynamic orthotic device. 4,202,327, Cl. 128-78.000.

Glander, Siegfried: *See—*
von der Eltz, Hans-Ulrich; and Glander, Siegfried, 4,202,112, Cl. 34-4.000.

Gloster, Arthur: *See—*
Conroy, Edward H.; Gloster, Arthur; and King, James A., 4,202,667, Cl. 23-302.00T.

Goans, Kip B.: *See—*
Akkerman, Neil H.; and Goans, Kip B., 4,202,368, Cl. 137-498.000.

Gocho, Nagahiro: *See—*
Kamachi, Shinichi; and Gocho, Nagahiro, 4,203,031, Cl. 250-201.000.

Goddard, Terrence P., to Teledyne McCormick Selph. Propellant and pyrotechnic with amino-substituted guanidine salts of decahydrodecaboric acid. 4,202,712, Cl. 149-22.000.

Gold, Lawrence W. External catheter drainage device. 4,202,335, Cl. 128-295.000.

Goldstein, Arthur L., to Ionics, Incorporated. Fluid distribution cell module. 4,202,772, Cl. 210-232.000.

Golyanovsky, Anton V.; and Kuznetsov, Albert P. Rotary mower. 4,202,156, Cl. 56-13.600.

Gonda, Gerald J.; and Vancza, John, Jr., to Tri-Tronics, Inc. Dog training collars and methods. 4,202,293, Cl. 119-29.000.

Gonzales, Albert S. Antifreeze means for car-wash wet-vacuum cleaning machines. 4,202,072, Cl. 15-302.000.

Goodman, Philip: *See—*
Kovac, Michael G.; Chleck, David J.; and Goodman, Philip, 4,203,087, Cl. 338-35.000.

Goodyear Tire & Rubber Company, The: *See—*
Mineur, Mark H.; and Toth, Robert L., 4,202,392, Cl. 152-330.00L.
Young, John J., 4,202,159, Cl. 56-364.000.

Goose, Jack: *See—*
Parkinson, Derek; and Goose, Jack, 4,202,503, Cl. 241-194.000.

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Goransson, Rolf E., to Internationella Siporex AB. Method of cutting slabs from a body of uncured, light-weight concrete and an apparatus for carrying out the method. 4,202,228, Cl. 83-23.000.

Gordon, James P.; Nahory, Robert E.; Pollack, Martin A.; and Worlock, John M., to Bell Telephone Laboratories, Incorporated. Low noise multistage avalanche photodetector. 4,203,124, Cl. 357-13.000.

Gordon, James R. Scraper assembly for a conveyor belt. 4,202,437, Cl. 198-497.000.

Goto, Shoziro: *See—*
Oda, Yoshio; Suhara, Manabu; Goto, Shoziro; Hukushima, Takashi; Miura, Koji; and Hamano, Toshikatsu, 4,202,743, Cl. 204-98.000.

Gottfried, Mario H., Jr.: *See—*
Burnham, J. Kellogg; and Gottfried, Mario H., Jr., 4,202,518, Cl. 244-12.100.

Gould Inc.: *See—*
Cronin, John C., 4,202,998, Cl. 174-31.00R.

Grace, Frederick J. Waterway cleaner with endless bucket conveyor. 4,202,119, Cl. 37-69.000.

Graham, David E.: *See—*
Schneider, Louis; and Graham, David E., 4,202,821, Cl. 260-326.50S.

Granier, Pierre M., to Societe d'Etudes et d'Applications Technologiques-Serat. Catheter for the examination or treatment of a blood vessel and apparatus for the utilization of this catheter. 4,202,346, Cl. 128-658.000.

Grapha-Holding AG: *See—*
Muller, Hans, 4,202,232, Cl. 83-519.000.

Graubert, Seth: *See—*
Leskiw, Alexander; and Graubert, Seth, 4,202,541, Cl. 271-132.000.

Gray, Reed A.; Tseng, Chien K.; and Rusay, Ronald J., to Stauffer Chemical Company. 1-Hydroxy-2-(alkylketo)-4,4,6,6-tetramethyl cyclohexen-3,5-diones. 4,202,840, Cl. 260-438.100.

Green, Brian R.: *See—*
Hancock, Robert D.; Bond, Roy F.; and Green, Brian R., 4,202,944, Cl. 521-32.000.

Green, William M. Latch for escape door. 4,202,572, Cl. 292-217.000.

Greenbaum, Robert R., to Bethlehem Steel Corporation. Method for producing calcined coke pellets. 4,202,734, Cl. 201-6.000.

Greenberg, Arthur: *See—*
Klavan, Irving L.; Calabrese, Peter J.; Finch, Theron R.; Greenberg, Arthur; and McElroy, Robert P., 4,202,620, Cl. 355-10.000.

Klavan, Irving L.; Calabrese, Peter J.; Finch, Theron R.; Greenberg, Arthur; and McElroy, Robert P., 4,202,913, Cl. 430-106.000.

Greenberg, Jack, to A. H. Robins Company, Inc. Insect-combatting device. 4,202,129, Cl. 43-131.000.

Greenspan, Donald J. Method for separating serum or plasma from the formed elements of blood. 4,202,769, Cl. 210-83.000.

Grenier, Raymond P., to Baird Corporation. Method and apparatus for determining the condition of a biological specimen. 4,203,035, Cl. 250-363.00S.

Greune, Christian: *See—*
Jurisch, Wilhelm; Greune, Christian; and Maier, Karl, 4,202,171, Cl. 60-39.28R.

Grigorenko, Anatoly S.; Moroz, Jury A.; Kuznetsov, German N.; Vimba, Vladimir I.; Landyshev, Vladimir V.; Bocharov, Jury A.; and Safonov, Anatoly V. Hydraulic drive. 4,202,174, Cl. 60-413.000.

Gross, Paul; Konrad, Eugen; and Mager, Herbert, to Wella AG. Hair shampoo and conditioning lotion. 4,202,881, Cl. 424-70.000.

Gruber, Bruce A.; and Lorenz, Donald H., to GAF Corporation. Copolymerizable, ultraviolet light absorber (2-cyano-3,3-diphenylacryloxy) alkylene ethylenic ethers. 4,202,834, Cl. 260-465.00D.

Gruber, Bruce A.; and Lorenz, Donald H., to GAF Corporation. Acetoxyalkyl cyanoacetate intermediates in the manufacture of copolymerizable, ultraviolet light absorber compounds. 4,202,836, Cl. 260-465.400.

Gruber, Heinz, to Kusters, Eduard. Apparatus for applying a liquid on a moving web in patterns. 4,202,188, Cl. 68-205.00R.

Grudzinskas, Charles V.: *See—*
Floyd, Middleton B., Jr.; Weiss, Martin J.; Grudzinskas, Charles V.; and Chen, Sow-Mei L., 4,202,989, Cl. 560-118.000.

Gruzdev, Evgeny A.: *See—*
Smirnov, Boris A.; Busygin, Valery P.; Komina, Lidia S.; Mochalov, Vyacheslav N.; Shagalov, Lev V.; and Gruzdev, Evgeny A., 4,202,314, Cl. 128-218.00F.

GTE Automatic Electric Laboratories Incorporated: *See—*
Kline, Ralph L., 4,203,003, Cl. 455-111.000.

Guckel, Henry; and Larsen, Steven T., to Wisconsin Alumni Research Foundation. Electrostatically deformable thin silicon membranes. 4,203,128, Cl. 357-60.000.

Guddal, Erling; and Borrevang, Poul, to Novo Industri A/S. Process for the production of penam and cephem derivatives. 4,202,817, Cl. 260-239.100.

Guenther, Ernst: *See—*
Hoerauf, Werner; Pirzer, Hans; Guenther, Ernst; Neumann, Eckart; and Dietrich, Ernst, 4,202,375, Cl. 138-39.000.

Guimond, Roy A.; Reed, Nanci W.; and Gulliksen, John E., to Koehler Manufacturing Company. Storage batteries of the lead-acid class and methods of making and operating same. 4,202,936, Cl. 429-163.000.

Guinon, Walter J.: *See—*
Bowles, William M.; Cox, Duncan B., Jr.; and Guinon, Walter J., 4,203,071, Cl. 375-1.000.

Gulf Research & Development Company: *See—*
Acheson, Willard P.; Morris, Richard A.; Rennard, Raymond J.; and Viswanathan, Thiagarajan, 4,202,168, Cl. 60-39.060.
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Gulliksen, John E.: *See—*
Guimond, Roy A.; Reed, Nanci W.; and Gulliksen, John E., 4,202,936, Cl. 429-163.000.

Gunkel, Walter A.; and Lybecker, Robert W., to Hughes Tool Company. Drill pipe identification method and system. 4,202,490, Cl. 235-449.000.

Gunther, Arnold. Device to control evaporation losses from liquid holding storage tanks. 4,202,458, Cl. 220-85.00B.

Gur, David; Sashin, Donald; and Sternglass, Ernest J., to University of Pittsburgh. Collimated radiation apparatus. 4,203,037, Cl. 250-505.000.

Guthrie, Robert W.: *See—*
Fahrenholtz, Kenneth E.; Guthrie, Robert W.; Kierstead, Richard W.; and Tilley, Jefferson W., 4,202,978, Cl. 544-393.000.

Gutner, Kenneth H. Method of making a furniture leveling device. 4,202,083, Cl. 29-150.000.

Gutshall, Charles E., to Technofast, Inc. Recessed head screw. 4,202,244, Cl. 85-45.000.

H. Niemeyer Sohne GmbH & Co. KG: *See—*
Barlage, Bruno, 4,202,415, Cl. 172-125.000.

Habermeier, Jurgen; Moser, Roland; and Seiz, Wolfgang, to Ciba-Geigy Corporation. Bis-anthranilates. 4,202,987, Cl. 560-49.000.

Haeckel, Rainer; and Heinz, Fritz, to Human Gesellschaft mbH fur Biotopanalytic und Biotopschutz. Procedure for the quantitative determination of hydrogen peroxide concentration in aqueous solutions. 4,202,938, Cl. 435-10.000.

Haffer, Gregor: *See—*
Sauer, Gerhard; Hauser, Helmut; Haffer, Gregor; Ruppert, Juergen; Eder, Ulrich; and Wiechert, Rudolf, 4,202,991, Cl. 560-255.000.

Hagen, Remon: *See—*
Jan, Gerald; Hagen, Remon; and Lenoir, John, 4,202,698, Cl. 430-418.000.

Haigh, John M., deceased; and by Quinlan, Joyce E., administrator. Method of dye absorption into the surface of plastic. 4,202,663, Cl. 8-471.000.

Hair, Hugh A.: *See—*
Gerst, Carl W.; Hair, Hugh A.; and Rehnmark, Stig L., 4,203,114, Cl. 343-100.0SA.

Haji, Takashi: *See*—
Haneda, Yoshikazu; Yamamoto, Yoshun; Matsufuji, Akira; Haji, Takashi; and Nakajima, Koe, 4,202,192, Cl. 72-21.000.
Hakansson, Bjarne C., to Linden & Linder AB. Device for producing sounds, which can be coupled to a musical instrument. 4,202,237, Cl. 84-1.240.
Halcomb, Ronald G.: *See*—
Frikken, Bert R.; and Halcomb, Ronald G., 4,202,856, Cl. 264-221.000.
Hale, Frank L.: *See*—
Hale, John D.; and Hale, Frank L., 4,202,175, Cl. 60-477.000.
Hale, John D.; and Hale, Frank L. Hydraulic control system for a dump truck. 4,202,175, Cl. 60-477.000.
Hall, Randall C.; and Ehrlich, Burney J., to Tracor, Inc. Method and apparatus for preventing the destruction of an alkali source of a nitrogen-phosphorous detector. 4,202,666, Cl. 23-232.00E.
Hall, Robert C.: *See*—
Storey, L. Robert; and Hall, Robert C., 4,202,760, Cl. 210-22.00A.
Hall, Robert N.: *See*—
Cannon, Curtis W.; and Hall, Robert N., 4,202,867, Cl. 423-301.000.
Hallett, Michael H.; Heneghan, Michael J.; and Sowter, Brian R., to International Business Machines Corporation. Cathode ray tube apparatus. 4,203,051, Cl. 315-13.00C.
Halliburton Company: *See*—
Burnham, John W.; Briscoe, James E.; and Elphingstone, Eugene A., 4,202,795, Cl. 252-332.000.
Haluch, Leonard M.: *See*—
Krolopp, Otto C.; and Haluch, Leonard M., 4,202,759, Cl. 209-234.000.
Hamaguchi, Yoshiharu: *See*—
Masuda, Teruo; Watanabe, Nobuhiko; Abe, Takeo; Koike, Matsuhiro; Morita, Masayasu; Oguma, Yoshio; Hamaguchi, Yoshiharu; Hirata, Motonobu; Saito, Mamoru; Onoguchi, Kunio; Yamaguchi, Kazuyuki; and Hirose, Akira, 4,202,257, Cl. 99-348.000.
Hamano, Toshikatsu: *See*—
Oda, Yoshio; Suhara, Manabu; Goto, Shoziro; Hukushima, Takashi; Miura, Koji; and Hamano, Toshikatsu, 4,202,743, Cl. 204-98.000.
Hambrick, William H., Sr.; and Raybon, Charles L. Acoustic impulse generator. 4,202,425, Cl. 181-120.000.
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DeLuca, Hector F.; Schnoes, Heinrich K.; Hamer, David E.; and Paaren, Herbert E., 4,202,829, Cl. 260-397.200.
Hammann, Ingeborg: *See*—
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Hammond, Peter R.; Henry, Ronald A.; Trias, John A.; and Schimitischek, Erhard J., to United States of America, Navy. Substituted -6,7,8,9-tetrahydro-pyrido- and 2H-pyrano [2,3-b][1,8]naphthyridines, stable efficient laser dyes. 4,202,981, Cl. 546-82.000.
Hamrick, James C., to Thomas Industries of Tennessee Inc. Pneumatic rodding of conduit using everted flexible tubing. 4,202,531, Cl. 254-134.400.
Hanas, Walter E.; and Sutko, Ronald R., to Honeywell Inc. Injection molding apparatus for accommodating various sizes of molding die inserts. 4,202,522, Cl. 249-102.000.
Hancock, Robert D.; Bond, Roy F.; and Green, Brian R., to National Institute for Metallurgy. Selective ion exchange resins with pyridylimidazolyl chelating functional groups. 4,202,944, Cl. 521-32.000.
Haneda, Yoshikazu; Yamamoto, Yoshun; Matsufuji, Akira; Haji, Takashi; and Nakajima, Koe, to Nippon Steel Corporation. Apparatus for controlling the position of roll in the direction of the roll axis. 4,202,192, Cl. 72-21.000.
Hanes Corporation: *See*—
DiTullio, Flavia, 4,202,853, Cl. 264-138.000.
Haning, James O.; Kool, Bram; Moritz, Jules G.; and Mizrahi, Robert, to Microform Data Systems, Inc. Film strip handling apparatus and method. 4,202,613, Cl. 353-120.000.
Hannigan, Joseph F., to United States of America, Army. Zero-doppler shift positioning technique. 4,203,115, Cl. 343-112.00R.
Hansen, Laird H. Spark plug boot puller. 4,202,088, Cl. 29-280.000.
Hansler, Richard L.: *See*—
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Hanson, Raymond, to USM Corporation. Method of heat setting footwear. 4,202,066, Cl. 12-142.00R.
Hara, Tatsuo: *See*—
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Harada, Masahiro: *See*—
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Harada, Susumu: *See*—
Kondo, Toshio; Harada, Susumu; Ito, Nobuyuki; and Kobayashi, Nobuyuki, 4,202,295, Cl. 123-32.0EH.
Hard Af Segerstad, Goran J. F. Curtain suspension devices. 4,202,074, Cl. 16-94.00D.
Harding, Frank M. Combination bag holder and dolly. 4,202,521, Cl. 248-98.000.
Harfst, Robert G. Vacuum apparatus with concrete housing, and method of constructing same. 4,202,070, Cl. 15-300.00A.
Hargraves, David P.; Pauli, Jude A.; and Williams, Steven E., to Emerson Electric Co. Four way valve. 4,202,373, Cl. 137-625.290.
Harrington, F. Eugene: *See*—
Babington, Ronald G.; and Harrington, F. Eugene, 4,202,897, Cl. 424-250.000.
Harris, John L., to Deltrol Corp. Adjustable interval cycle timer. 4,203,014, Cl. 200-38.00R.
Harrison, George W., to Team, Inc. Pipe cleaning and plugging apparatus. 4,202,377, Cl. 138-94.000.
Hartenstein, Johannes; and Satzinger, Gerhard, to Warner-Lambert Company. Process for the preparation of 1-hydroxyaporphine-derivatives. 4,202,980, Cl. 546-75.000.
Hartert, Hellmut, to Dr. E. Fresenius Chem.-Pharm. Industrie KG. Apparatus and method for measuring changes in conditions in coagulating liquids. 4,202,204, Cl. 73-64.100.
Hartford, Allen, Jr.; and Tuccio, Sam A., to Allied Chemical Corporation. Enrichment of nitrogen isotopes by induced isomerization of isocyanides. 4,202,741, Cl. 204-158.00R.
Hartman, Louis P.: *See*—
Burbo, James H.; and Hartman, Louis P., 4,202,601, Cl. 350-159.000.
Hartman, Susan E.: *See*—
Merrill, Stewart H.; Hartman, Susan E.; Noonan, John M.; Sandhu, Mohammad A.; and Santilli, Domenic, 4,202,785, Cl. 430-106.000.
Hartmann & Braun AG.: *See*—
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Hartung, Rodney L.: *See*—
Abraham, Edward D.; and Hartung, Rodney L., 4,202,399, Cl. 164-203.000.
Harvey, Donald M., to Eastman Kodak Company. Photographic cameras. 4,202,614, Cl. 354-121.000.
Harvey Hubbell, Incorporated: *See*—
Hoffman, Ernest G., 4,202,590, Cl. 339-107.000.
Harwood, Leopold A.; Wittmann, Erwin J.; and Shanley, Robert L., II, to RCA Corporation. Predictable automatic brightness control circuit in a video signal image reproducing system. 4,203,131, Cl. 358-34.000.
Hashimoto, Susumu: *See*—
Suzuki, Etsuji; Kashihara, Tomio; Hashimoto, Susumu; Watanabe, Ken; and Kodama, Tsuyoshi, 4,203,064, Cl. 318-640.000.
Hasquenoph, Jean H.; and Coutin, Pierre F., to R. Alkan & Cie. Device for locking to fixed supports loads carried under aircraft. 4,202,576, Cl. 294-83.00R.
Hatfield, David G., to Interpace Corporation. Apparatus for decorating surfaces of ceramic ware. 4,202,290, Cl. 118-211.000.
Hatori, Nobuyoshi; and Morigami, Eiiji, to Ivasaki Tsushinki Kabushiki Kaisha. System for receiving remote control signal in automatic telephone answering device. 4,203,007, Cl. 179-6.00E.
Haunstetter, Franz; and Koppelmann, Gerhard, to Siemens Aktiengesellschaft. Arrangement for producing a constant signal amplitude in an opto-electronic scanning system. 4,203,032, Cl. 250-205.000.
Hauser, Helmut: *See*—
Sauer, Gerhard; Hauser, Helmut; Haffer, Gregor; Ruppert, Juergen; Eder, Ulrich; and Wiechert, Rudolf, 4,202,991, Cl. 560-255.000.
Hauser, Kurt: *See*—
Nonnenmann, Manfred; Hauser, Kurt; and Schwarz, Gebhard, 4,202,296, Cl. 123-41.480.
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Kittag, Gerd, 4,202,610, Cl. 352-91.00C.
Hausman, John M. Structure for hydraulic power apparatus. 4,202,264, Cl. 100-269.00A.
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Hayashida, Shuji: *See*—
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Cann, Peter L.; Hayes, Richmond S., Jr.; and Miller, Lester N., 4,202,409, Cl. 165-122.000.
Haynes, Kenneth H. Constant volume aerated showerhead apparatus. 4,202,501, Cl. 239-570.000.
Heberlein Hispano SA: *See*—
Vignon, Louis, 4,202,162, Cl. 57-58.890.
Heck, Richard A.; and Dekker, David J., to Sundberg-Ferar, Inc. Adjustable shade construction. 4,202,395, Cl. 160-84.00R.
Heide, Helmut: *See*—
Reiner, Roland; Heide, Helmut; and Koster, Kari, 4,202,055, Cl. 3-1.910.

Heidelberger Druckmaschinen Aktiengesellschaft: *See*—
Becker, Willi, 4,202,268, Cl. 101-409.000.

Heilman, Marlin S.: *See*—
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Rech, Werner; Welsch, Wolfgang; and Achter, Eugen, 4,203,050, Cl. 313-220.000.

Heinz, Fritz: *See*—
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Heinzl, Joachim; Kern, Hans; and Giebler, Fritz, to Siemens Aktiengesellschaft. Device for monitoring the ink supply in ink-operated printers. 4,202,267, Cl. 101-364.000.

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Breitschwerdt, Werner; Andres, Rudolf; Heiss, Werner; and Fussnegger, Wolfgang, 4,202,577, Cl. 296-24.00R.

Heitzman, Russell A. Visual feed control assembly for carriage-fed sawmill saws. 4,203,060, Cl. 318-474.000.

Held, Ross, to D. T. Equipment Limited. Snowmobile trail groomer. 4,202,118, Cl. 37-41.000.

Helfrich, Adam: *See*—
Becker, Bernd; Forch, Hans; Helfrich, Adam; and Jung, Gottfried, 4,202,555, Cl. 277-153.000.

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Eckert, Theodor; Kemper, Fritz H.; Wischniewski, Martin; and Hempel, Reinhard, 4,202,888, Cl. 424-182.000.

Henbest, Richard G. C.; and McGregor, Kenneth, to Imperial Chemical Industries Limited. Sulfite-modified fibrous resinous material. 4,202,959, Cl. 528-254.000.

Hendrickson, Carl E. Portable device for mixing two materials. 4,202,635, Cl. 366-162.000.

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Exner, Jurgen H.; and Henke, Cyril B., 4,202,745, Cl. 204-180.00R.

Hennecke, Franz, to I. P. U. Limited. Flame cutting apparatus and method. 4,202,707, Cl. 148-9.00R.

Henry, David W.: *See*—
Tong, George L.; Henry, David W.; Wu, Helen Y.; and Smith, Thomas H., 4,202,967, Cl. 536-17.00A.

Henry, Ronald A.: *See*—
Hammond, Peter R.; Henry, Ronald A.; Trias, John A.; and Schimitischek, Erhard J., 4,202,981, Cl. 546-82.000.

Henry Simon Limited: *See*—
Cook, Kenneth, 4,202,466, Cl. 222-1.000.

Hercules Incorporated: *See*—
Steller, Kenneth E., 4,202,790, Cl. 252-186.000.

Hermann Berstorff Maschinenbau GmbH: *See*—
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Hermann Finckh Maschinenfabrik: *See*—
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Herron, Charles R., to National Mine Service Company. Stabilizer assembly for a mining machine conveyor. 4,202,434, Cl. 198-316.000.

Herstad, Oystein. Helicopter landing platform. 4,202,646, Cl. 404-36.000.

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Heymes, Rene; and Lutz, Andre, to Roussel Uclaf. Alkyloximes of 7-amino-thiazolyl-acetamido-cephalosporanic acids. 4,202,893, Cl. 424-246.000.

HICAP Engineering & Development Corp.: *See*—
Davis, William L., Jr., 4,202,534, Cl. 266-172.000.

Hickman, Ronald P., to Inventec International Limited. Ladder. 4,202,428, Cl. 182-22.000.

Hihara, Yukiyoshi, to Yasui Sangyo Co. Ltd. Wheel fixing device for a wheel balancer. 4,202,214, Cl. 73-487.000.

Hilfman, Lee, to UOP Inc. Hydrocarbon isomerization process. 4,202,996, Cl. 585-377.000.

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O'Hara, Mark J.; Johnson, Russell W.; and Hilfman, Lee, 4,202,758, Cl. 208-143.000.

Hill, Robin E. T.; Mann, Alan W.; McDonald, Ean L.; and Perdrix, John L. Adjustable float sinker. 4,202,128, Cl. 43-43.140.

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Steigerwald, Karl-Heinz; Scheffels, Wilhelm; Anderl, Peter; Konig, Dieter; Hiller, Walther; and Rappold, Franz, 4,203,023, Cl. 219-121.0EB.

Hillery, Herbert V., to United States of America, Navy. Acoustic filter. 4,203,165, Cl. 367-135.000.

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Browne, Kenneth A.; Cripe, Alan R.; and Hindin, Eugene, 4,202,276, Cl. 105-165.000.
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Hiraga, Ryozo: *See*—
Suzki, Akiyoshi; Kano, Ichiro; Yoshinari, Hideki; Tozuka, Masao; Hiraga, Ryozo; Kato, Yuzo; and Ogino, Yasuo, 4,202,627, Cl. 356-71.000.

Hirai, Masataka; and Matsuno, Koichiro, to Nippon Telegraph and Telephone Public Corp.; Sumitomo Electric Industries, Ltd.; and Sumitomo Electric Industries, Ltd. Method and apparatus for cutting optical fibers. 4,202,475, Cl. 225-2.000.

Hirata, Motonobu: *See*—
Masuda, Teruo; Watanabe, Nobuhiko; Abe, Takeo; Koike, Matsuhiro; Morita, Masayasu; Oguma, Yoshio; Hamaguchi, Yoshiharu; Hirata, Motonobu; Saito, Mamoru; Onoguchi, Kunio; Yamaguchi, Kazuyuki; and Hirose, Akira, 4,202,257, Cl. 99-348.000.

Hirose, Akira: *See*—
Masuda, Teruo; Watanabe, Nobuhiko; Abe, Takeo; Koike, Matsuhiro; Morita, Masayasu; Oguma, Yoshio; Hamaguchi, Yoshiharu; Hirata, Motonobu; Saito, Mamoru; Onoguchi, Kunio; Yamaguchi, Kazuyuki; and Hirose, Akira, 4,202,257, Cl. 99-348.000.

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Hirs, Gilles G., to B.V. Neratoom. Heat shield and apparatus comprising same. 4,202,552, Cl. 277-26.000.

Hirsch, Leon C.; Rawson, Paul O.; and Nagy, Louis E., to United States Surgical Corporation. Temperature and respiration sensing probe. 4,202,353, Cl. 128-724.000.

Hisamatsu, Takashi: *See*—
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Itoh, Takashi, 4,203,056, Cl. 315-389.000.
Kawashima, Kenichi; Arima, Yosiaki; Endo, Yoshihide; Suginuma, Atsushi; Uenishi, Akira; and Miyamoto, Seigo, 4,202,182, Cl. 62-511.000.
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Nakatani, Mitsuo; Kuroki, Takashi; Syozi, Toshiaki; and Horibe, Yoshiyuki, 4,203,025, Cl. 219-216.000.
Shimizu, Norio; and Odawara, Youji, 4,202,763, Cl. 210-14.000.
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Takahashi, Toshiyori; Ojima, Akihiro; Matsumoto, Teruo; and Kashiwakura, Koji, 4,203,038, Cl. 250-507.000.

Hlinka, Joseph W.; Whitmore, Bruce C.; and Ozgu, Mustafa R., to Bethlehem Steel Corporation. Method of continuously casting molten metal. 4,202,397, Cl. 164-82.000.

Hobbs, James E., to Chemworld Corporation. Water control device for flush valves. 4,202,525, Cl. 251-40.000.

Hobbs, Jim F.; and Smyser, Craig. Method of incineration. 4,202,282, Cl. 110-346.000.

Hochiki Corporation: *See*—
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Hodges, Donald R.: *See*—
Sherwood, William G.; Hodges, Donald R.; and Nikolic, Cvetko, 4,202,752, Cl. 204-222.000.

Hodgson, Rodney T.; Hovel, Harold J.; and Woodall, Jerry M., to International Business Machines Corporation. Optical energy conversion. 4,202,704, Cl. 136-89.0CL.

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Korbanka, Helmut; and Scheidl, Franz, 4,202,830, Cl. 260-429.700.
Michel, Wolfgang; and Becker, Reinhold, 4,202,075, Cl. 17-41.000.
Moraw, Roland; and Schadlich, Gunther, 4,202,693, Cl. 430-50.000.
Thoese, Klaus, 4,202,923, Cl. 428-144.000.
von der Eltz, Hans-Ulrich; and Glander, Siegfried, 4,202,112, Cl. 34-4.000.

Hoehn, Hans, to E. R. Squibb & Sons, Inc. Imidazolylethoxy derivatives of quinoline-3-methanols. 4,202,985, Cl. 546-176.000.

Hoehn, Hans: *See*—
Denzel, Theodor; and Hoehn, Hans, 4,202,899, Cl. 424-251.000.

Hoerauf, Werner; Pirzer, Hans; Guenther, Ernst; Neumann, Eckart; and Dietrich, Ernst, to BASF Aktiengesellschaft. Process and apparatus for achieving a uniform flow profile. 4,202,375, Cl. 138-39.000.

Hoesch Werke Aktiengesellschaft: *See*—
den Hartog, Huibert; Stann, Klaus; and Stolze, Lutz, 4,202,194, Cl. 72-78.000.

Hoff, Robert W. Chemical recovery filter. 4,202,771, Cl. 210-130.000.

Hoffman, Ernest G., to Harvey Hubbell, Incorporated. Interlock arrangement for an electrical terminal enclosure. 4,202,590, Cl. 339-107.000.

Hoffman-La Roche Inc.: *See*—
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Hoffmann-La Roche Inc.: *See*—
Alig, Leo; Furst, Andor; Muller, Marcel; Kerb, Ulrich; Kieslich, Klaus; and Wiechert, Rudolf, 4,202,841, Cl. 424-311.000.
Fahrenholtz, Kenneth E.; Guthrie, Robert W.; Kierstead, Richard W.; and Tilley, Jefferson W., 4,202,978, Cl. 544-393.000.
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Furst, Andor; Keller, Peter; and Muller, Marcel, 4,202,823, Cl. 260-343.600.
Pfiffner, Albert, 4,202,894, Cl. 424-248.400.
Suhara, Yasuji; Maruyama, Hiromi; Itoh, Sayuri; and Yokose, Kazuteru, 4,202,943, Cl. 435-280.000.
Hofmann, Werner: *See*—
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Hogle, Kenneth A. Brush guide. 4,202,105, Cl. 33-483.000.
Holik, Dennis J.: *See*—
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Holle, Robert F.; and Hansler, Richard L., to General Electric Company. Fused silica lamp envelope and seal. 4,202,999, Cl. 174-50.610.
Holmes, Lloyd H., to E-Systems, Inc. Shock suppressor valve test system and method. 4,202,209, Cl. 73-168.000.
Holz, Emil, to Hermann Finckh Maschinenfabrik. Sorting apparatus for sorting fiber suspensions. 4,202,761, Cl. 209-17.000.
Holzl, Robert A.; Pickett, Frederick P.; and Lawrence, James L., Jr., to U.T.I.-Spectrotherm Corporation. Mass spectrometer filter. 4,202,080, Cl. 29-25.180.
Homann, Reimer; and Raptopoulos, Prodromos, to Carl Schenck Aktiengesellschaft, Firma. Method and apparatus for regulating the brake torque of an eddy current brake. 4,203,046, Cl. 310-93.000.
Homma, Hiroshi: *See*—
Yamauchi, Yukio; and Homma, Hiroshi, 4,203,100, Cl. 340-630.000.
HON Industries Inc.: *See*—
Mosch, Duane L., 4,202,565, Cl. 280-756.000.
Honacker, Horst, to Envirotech Corporation. Collector electrodes for electrostatic precipitators. 4,202,675, Cl. 55-118.000.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
Sato, Makoto; Takamatsu, Hiroshi; Miyagawa, Yoshitaka; and Fujii, Etsuo, 4,202,584, Cl. 303-105.000.
Honeywell Inc.: *See*—
Hanas, Walter E.; and Sutko, Ronald R., 4,202,522, Cl. 249-102.000.
Hong, In S.; and Roelofs, Glenn E., to Minnesota Mining and Manufacturing Company. Conformable hand sanding pad. 4,202,139, Cl. 51-393.000.
Hood, Jackylene K.: *See*—
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Hooker, James A.; Martin, Dean W.; and Williamson, Shellie O., to Caterpillar Tractor Co. Apparatus for rotating of track bushing by combined static and dynamic torque. 4,202,224, Cl. 81-3.00R.
Horibe, Yoshiyuki: *See*—
Nakatani, Mitsuo; Kuroki, Takashi; Syozi, Toshiaki; and Horibe, Yoshiyuki, 4,203,025, Cl. 219-216.000.
Horiuchi, Harumi, to Soundesign Corporation. Play/record switching circuit for a signal reproducing and recording apparatus. 4,203,139, Cl. 360-62.000.
Horn, Gerald H. Coil-carrying vehicle and method of using same. 4,202,509, Cl. 242-86.50R.
Horn, Robert E.: *See*—
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Hoshino, Toshisuke: *See*—
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Hovel, Harold J.: *See*—
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Howell, Bryan G., and Ringrose, Gordon H., to Twinpak Ltd. Flexible wall pouch with label. 4,202,450, Cl. 206-459.000.
Howse, Paul T., Jr.; and Wilkie, Arnold E., to Monsanto Company. Polyamide spin-texture process. 4,202,854, Cl. 264-168.000.
Hoyt, Maurice A.: *See*—
Viravec, Joseph T.; and Hoyt, Maurice A., 4,202,369, Cl. 137-508.000.
Hren, John J.; Clark, David E.; Jenkins, David A.; Johnson, Paul F., III; and Degler, Howead E., Jr., to Concept, Inc. Bipolar electrosurgical knife. 4,202,337, Cl. 128-303.140.
Hubbard, Lonnie G.: *See*—
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Hughes, Richard J., to Research Technology Inc. Moisture stripping device for film cleaning apparatus. 4,202,073, Cl. 15-306.00A.
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Reavis, Robert P., Jr.; Soderstrom, Melvin A.; Vachhani, Vasantrai A.; and Hughes, Richard L., 4,202,589, Cl. 339-97.00R.
Hughes, Theodore R.; and McCarty, Glenn L., to McCarty, Glen L. Web cutting and splicing apparatus. 4,202,720, Cl. 156-353.000.
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Gunkel, Walter A.; and Lybecker, Robert W., 4,202,490, Cl. 235-449.000.
Hukushima, Takashi: *See*—
Oda, Yoshio; Suhara, Manabu; Goto, Shoziro; Hukushima, Takashi; Miura, Koji; and Hamano, Toshikatsu, 4,202,743, Cl. 204-98.000.
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Haeckel, Rainer; and Heinz, Fritz, 4,202,938, Cl. 435-10.000.
Hunkar, Denes B.; and Ortlepp, Hans, to Hunkar Laboratories, Inc. Closed loop electro-fluidic control system. 4,202,247, Cl. 91-364.000.
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Hunter, Don L.; Woods, William G.; Stone, James D.; and LeFevre, Cecil W., to United States Borax & Chemical Corporation. Nitrophenylhydrazine compounds. 4,202,839, Cl. 260-569.000.
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Hvizdos, Leonard J., to Air Products & Chemicals, Inc. Air separation liquefaction process. 4,202,678, Cl. 62-38.000.
Hydes, Alan F., to International Business Machines Corporation. Character display system. 4,203,102, Cl. 340-723.000.
Hypertherm, Incorporated: *See*—
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Ibarra, Guillermo N. Device for receiving and disposing of urine from bedridden women. 4,202,057, Cl. 4-144.300.
Ichelson, David L. Jogger's brassiere. 4,202,343, Cl. 128-438.000.
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Ikeda, Ryo; Nogami, Yoichi; and Koizumi, Teruo, to Yokohama Rubber Co., Ltd., The. Run flat tire for motorcycles. 4,202,393, Cl. 152-330.0RF.
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Illinois Tool Works Inc.: *See*—
Smith, Dennis D., 4,203,086, Cl. 337-410.000.
Imamura, Yoshio. Ignition plug. 4,202,307, Cl. 123-169.00V.
Imataki, Mitsumasa; Ujita, Katsu; and Egashira, Tsutomu, to Mitsubishi Denki Kabushiki Kaisha. Protective device. 4,203,143, Cl. 361-120.000.
Imbeault, Fernand A. Sectional floating cover. 4,202,460, Cl. 220-218.000.
Imber, William I., to Metal Box Limited. Containers having locking structure. 4,202,462, Cl. 220-293.000.
Imperial Chemical Industries Limited: *See*—
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Henbest, Richard G. C.; and McGregor, Kenneth, 4,202,959, Cl. 528-254.000.
Jones, Peter J. V., 4,202,797, Cl. 252-413.000.
Laska, Friedrich, 4,202,502, Cl. 241-82.500.
Mee, Alec, 4,202,995, Cl. 568-860.000.
Inaba, Shigeho; Yamamoto, Michihiro; Ishizumi, Kikuo; Mori, Kazuo; and Yamamoto, Hisao, to Sumitomo Chemical Company, Limited. 1-Polyhaloalkyl-2(1H)-quinazolinone derivatives. 4,202,895, Cl. 424-250.000.
Inbody, Melvin R., to Centerline Steering Safety Axle Corporation, The. Speedometer drive gear assembly for a centerline steering wheel assembly. 4,202,560, Cl. 280-96.300.
Incom International Inc.: *See*—
Williams, Gordon T., 4,202,082, Cl. 29-149.50B.
Industrial Insulations, Inc.: *See*—
Frahme, Carl E.; and Wygant, Gary E., 4,202,148, Cl. 52-592.000.
Industrias P. Freire, S.A.: *See*—
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Inouye, Hiromasa; Otsuki, Tomonari; and Saito, Tsukasa, to Bunker Ramo Corporation. Electrical connector. 4,202,595, Cl. 339-174.000.
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Pokhodnya, Igor K.; Shlepakov, Valery N.; and Suprun, Sergei A., 4,203,024, Cl. 219-146.100.
Institut Elementoorganicheskih Soedineny: *See*—
Nesmeyanov, Alexandr N.; Rogozhin, Sergei V.; Tolstoguzov, Vladimir B.; Misjurev, Vladimir I.; Ershova, Vera A.; and Braudo, Evgeny E., 4,202,908, Cl. 426-72.000.
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Institut Pasteur: *See*—
Marcovich, Herbert S.; and Perrin, Remi D., 4,202,736, Cl. 203-10.000.
Institutul National Pentru Creatie Stiintifica Si Tehnica: *See*—
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Jalan, Vinod M., to United Technologies Corporation. Noble metal/-vanadium alloy catalyst and method for making. 4,202,934, Cl. 429-40.000.

James, William L.; and Wonso, Alex P., to Fennell Corporation. Method for obtaining bright finish galvanizing coating on wire. 4,202,918, Cl. 427-224.000.

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Jones, James W. Radiopaque vessel markers. 4,202,349, Cl. 128-689.000.
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Byrne, Joseph H., Jr., 4,202,208, Cl. 73-139.000.
David, Joseph S., 4,202,442, Cl. 198-820.000.
Joyce, John E. Apparatus for use in generating liquid concentration gradients hydrostatically. 4,202,370, Cl. 137-585.000.
Judd, Fred V. H. Exhaust gas splitter construction. 4,202,426, Cl. 181-257.000.
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Jung, Wilfried; Peehs, Martin; Rau, Peter; Krug, Wolfgang; and Stechemesser, Horst, to Kraftwerk Union Aktiengesellschaft; and Kernforschungsanlage Julich GmbH. Tight connection between fission gas discharge channels. 4,202,732, Cl. 176-37.000.
Juntgen, Harald: *See*—
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Jurisch, Wilhelm; Greune, Christian; and Maier, Karl, to Motoren- und Turbinen-Union GmbH. Apparatus for dispensing fuel for a gas turbine engine. 4,202,171, Cl. 60-39.28R.
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Kali-Chemie Pharma GmbH.: *See*—
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Kamachi, Shinichi; and Gocho, Nagahiro, to Olympus Optical Co., Ltd. Automatic focussing apparatus for microscope. 4,203,031, Cl. 250-201.000.
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Kawasoko, Yoshiaki; Chiba, Iwane; Yamazaki, Noboru; Chiyonobu, Toshimi; and Shikuma, Masao, to Nippon Kokan Kabushiki Kaisha. Apparatus for annealing strip coils. 4,202,537, Cl. 266-252.000.
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Schmidt, Helmut; Strobel, Walter; Treude, Gunter; and Blaser, Paul, 4,202,640, Cl. 400-491.200.
Kierstead, Richard W.: *See*—
Fahrenholtz, Kenneth E.; Guthrie, Robert W.; Kierstead, Richard W.; and Tilley, Jefferson W., 4,202,978, Cl. 544-393.000.
Kieslich, Klaus: *See*—
Alig, Leo; Furst, Andor; Muller, Marcel; Kerb, Ulrich; Kieslich, Klaus; and Wiechert, Rudolf, 4,202,841, Cl. 424-311.000.
Kim, Sunyong P. Process for preserving vegetables used to make kimchee. 4,202,912, Cl. 426-615.000.
Kimball International, Inc.: *See*—
Wilcox, Brian N.; and Robinson, John W., 4,202,236, Cl. 84-1.030.
Kimura, Morihiro: *See*—
Shimada, Noburo; Miyamoto, Akira; Kobayashi, Motonobu; Kuribayashi, Akio; Toyoda, Takeharu; Kimura, Morihiro; Kyoden, Hiroshi; Hoshino, Toshisuke; and Watanabe, Jiro, 4,202,538, Cl. 266-275.000.
Kimura, Shoji: *See*—
Abe, Akira; Kimura, Shoji; and Kuwabara, Yuzo, 4,202,348, Cl. 128-680.000.
King, Arthur S. Combination electrolytic and electrostatic treater. 4,202,754, Cl. 204-272.000.
King, James A.: *See*—
Conroy, Edward H.; Gloster, Arthur; and King, James A., 4,202,667, Cl. 23-302.00T.
King, Olin B., to SCI Systems, Inc. Record drive system for rotary electrical stylus device. 4,203,120, Cl. 346-162.000.
King, Olin B., to SCI Systems, Inc. Rotary electrical printer and method using dot-by-dot synchronization. 4,203,121, Cl. 346-162.000.
King, Olin B., to SCI Systems, Inc. Electrical stylus adjustment means and method for rotary electrical printer. 4,203,122, Cl. 346-162.000.
King, William R. Brake control apparatus for railway cars. 4,202,583, Cl. 303-22.00R.
Kinoshita, Tomoo, to Nihon Repro Machine Kogyo Kabushiki Kaisha. Device for changing a wire netting in a filter device for synthetic resins. 4,202,659, Cl. 425-183.000.
Kioritz Corporation: *See*—
Nagashima, Akira, 4,202,096, Cl. 30-381.000.
Kirjavainen, Alvi, to Valmet Oy. Quick connect apparatus for headbox components in a paper making machine. 4,202,724, Cl. 162-272.000.
Kita, Donald A.; Gagne, John W.; and Fenton, Dennis M., to Pfizer Inc. Destruction by fermentation of 2-ketogluconate in the presence of 2-ketogulonate. 4,202,942, Cl. 435-262.000.
Kitajima, Nobuo: *See*—
Fukuda, Tadaji; Kajita, Isamu; Misumi, Teruo; Kondo, Hideyo; and Kitajima, Nobuo, 4,202,937, Cl. 430-58.000.
Kitchener, William R.; and Sama, Stephen L., to Artek Systems Corporation. Automatic object counter. 4,203,029, Cl. 235-92.0PC.
Kittag, Gerd, to Vockenhuber, Karl; and Hauser, Raimund. Motion picture camera with fade-in and fade-out effects during long-term exposure. 4,202,610, Cl. 352-91.00C.
Kitteridge, John M.; and Armstrong, Robert J., to Vickers Limited. Lithoplates of quaternary ammonium salt compositions. 4,202,699, Cl. 430-302.000.
Klaissle, Siegfried: *See*—
Haussmann, August; Klaissle, Siegfried; Hugger, Hermann; Moser, Bernhard; Muller, Walter; Peetz, Wolfgang; Scheuch, Anton; and Schwarz, Gerhard, 4,202,557, Cl. 279-19.500.
Peetz, Wolfgang; Klaissle, Siegfried; and Moser, Bernhard, 4,202,420, Cl. 175-395.000.
Klavan, Irving L.; Calabrese, Peter J.; Finch, Theron R.; Greenberg, Arthur; and McElroy, Robert P., to Philip A. Hunt Chemical Corp. Apparatus for liquid development of latent electrostatic images. 4,202,620, Cl. 355-10.000.
Klavan, Irving L.; Calabrese, Peter J.; Finch, Theron R.; Greenberg, Arthur; and McElroy, Robert P., to Philip A. Hunt Chemical Corp. Method for liquid development of latent electrostatic images. 4,202,913, Cl. 430-106.000.
Klein, Alfons; Knust, Ernst; Kron, Rudolf; and Wedemeyer, Karlfried, to Bayer Aktiengesellschaft. Chloro-diphenyl. 4,203,145, Cl. 361-317.000.
Klein, Jurgen: *See*—
Gappa, Gunther; Juntgen, Harald; and Klein, Jurgen, 4,202,770, Cl. 210-96.100.
Klimkovsky, Bronislav M.; Azikov, Boris A.; Zemtsov, Mikhail U.; Kusch, Sergei A.; and Nalivkin, Nikolai P. Thrower of transported materials. 4,202,439, Cl. 198-642.000.
Kline, Ralph L., to GTE Automatic Electric Laboratories Incorporated. Frame search control for digital transmission system. 4,203,003, Cl. 455-111.000.
Klockner-Humboldt-Deutz Aktiengesellschaft: *See*—
Jakobs, Willy, 4,202,629, Cl. 356-335.000.
Klodwig, Utz: *See*—
Maechtle, Walter; and Klodwig, Utz, 4,202,632, Cl. 356-427.000.
Klund, William E.: *See*—
Isaak, Robert D.; Klund, William E.; Littrell, Woodrow H.; and Stephenson, Richard G., 4,203,164, Cl. 367-134.000.
Kmetz, Allan R., to BBC Brown Boveri & Company Limited. Procedure of bargraph display for measured quantities. 4,203,104, Cl. 340-754.000.
Knowlton, Ted M., to Gas Research Institute. Coal conversion apparatus. 4,202,673, Cl. 48-86.00R.
Knudsen, Leland F. Center pivot irrigation system with slinger-type sprinkler means. 4,202,596, Cl. 239-177.000.
Knust, Ernst: *See*—
Klein, Alfons; Knust, Ernst; Kron, Rudolf; and Wedemeyer, Karlfried, 4,203,145, Cl. 361-317.000.
Kobayashi, Motonobu: *See*—
Shimada, Noburo; Miyamoto, Akira; Kobayashi, Motonobu; Kuribayashi, Akio; Toyoda, Takeharu; Kimura, Morihiro; Kyoden, Hiroshi; Hoshino, Toshisuke; and Watanabe, Jiro, 4,202,538, Cl. 266-275.000.
Kobayashi, Nobuyuki: *See*—
Kondo, Toshio; Harada, Susumu; Ito, Nobuyuki; and Kobayashi, Nobuyuki, 4,202,295, Cl. 123-32.0EH.
Kobayashi, Takumi: *See*—
Urano, Fumio; Arai, Akihiro; Kobayashi, Takumi; and Umetsu, Junji, 4,202,617, Cl. 354-268.000.
Kobe Steel, Ltd.: *See*—
Fukuzuka, Toshio; Shimogori, Kazutoshi; Satoh, Hiroshi; Kamikubo, Fumio; and Hara, Tatsuo, 4,202,751, Cl. 204-197.000.
Kocsis, Karoly; Fechtig, Bruno; and Bickel, Hans, to Ciba-Geigy Corporation. Derivatives of penam-3-carboxylic acid and a pharmaceutical composition containing the same. 4,202,900, Cl. 424-251.000.
Kodama, Tsuyoshi: *See*—
Suzuki, Etsuji; Kashihara, Tomio; Hashimoto, Susumu; Watanabe, Ken; and Kodama, Tsuyoshi, 4,203,064, Cl. 318-640.000.
Koehler Manufacturing Company: *See*—
Guimond, Roy A.; Reed, Nanci W.; and Gulliksen, John E., 4,202,936, Cl. 429-163.000.
Koei Chemical Co., Ltd.: *See*—
Yoshida, Norio; and Matuyama, Takesi, 4,202,806, Cl. 260-23.0XA.
Koff, Fred W.; Tunick, Allen A.; Sifniades, Stylianos; and Belden, Reed H., to Allied Chemical Corporation. Hydroxylamine purification via cation exchange. 4,202,765, Cl. 210-31.00R.
Koga, Tadashi: *See*—
Matsumoto, Seiji; Koga, Tadashi; Fukai, Kiyoshi; and Nakatani, Shinya, 4,202,871, Cl. 423-632.000.
Koike, Matsuhiro: *See*—
Masuda, Teruo; Watanabe, Nobuhiko; Abe, Takeo; Koike, Matsuhiro; Morita, Masayasu; Oguma, Yoshio; Hamaguchi, Yoshiharu; Hirata, Motonobu; Saito, Mamoru; Onoguchi, Kunio; Yamaguchi, Kazuyuki; and Hirose, Akira, 4,202,257, Cl. 99-348.000.
Koito Manufacturing Company Limited: *See*—
Miyauchi, Shizuya, 4,202,603, Cl. 350-289.000.
Koizumi, Hideaki; and Moriya, Kazuo, to Hitachi, Ltd. Flameless atomizer. 4,202,628, Cl. 356-312.000.
Koizumi, Teruo: *See*—
Ikeda, Ryo; Nogami, Yoichi; and Koizumi, Teruo, 4,202,393, Cl. 152-330.0RF.
Kojima, Michio: *See*—
Ohba, Kazunori; Shomura, Takashi; Ogawa, Yasuaki; Tsuruoka, Takashi; Watanabe, Hiroshi; Hisamatsu, Takashi; Uchida,

Shingo; Kojima, Michio; and Inouye, Shigeharu, 4,202,886, Cl. 424-122.000.

Kokta, Milan R.; Linares, Robert C.; and Di Giuseppe, Michael A., to Allied Chemical Corporation. Lanthanum indium gallium garnets. 4,202,930, Cl. 428-539.000.

Komatsu, Noboru; Arai, Tohru; and Fujita, Hinonori, to Kabushiki Kaisha Toyoto Chuo Kenkyusho. Treating bath, forming a mixed carbide layer of Va-Group elements on a ferrous alloy surface and resulting product. 4,202,705, Cl. 148-6.110.

Komatsu, Tatsuyoshi: *See*—
Matsuura, Ryo; Komatsu, Tatsuyoshi; Nomiyama, Yukio; and Usui, Kenji, 4,202,828, Cl. 260-396.00R.

Kombinat Gorniczo-Hutniczy Miedzihuta Miedzi "Legnica": *See*—
Demidowicz, Lech; and Sztuka, Mieczyslaw, 4,202,536, Cl. 266-135.000.

Komina, Lidia S.: *See*—
Smirnov, Boris A.; Busygin, Valery P.; Komina, Lidia S.; Mochalov, Vyacheslav N.; Shagalov, Lev V.; and Gruzdev, Evgeny A., 4,202,314, Cl. 128-218.00F.

Kominami, Naoya; Fukumi, Hirokazu; Yamawaki, Naokuni; and Nomura, Junji, to Asahi Kasei Kogyo Kabushiki Kaisha. Method for keeping aquatic animals alive over long period of time. 4,202,291, Cl. 119-3.000.

Komiyama, Katsuhiko; Kasama, Noriyuki; Tsukamoto, Keiji; and Murakami, Tomomi, to Citizen Watch Co., Ltd. Solid state watch module construction. 4,202,166, Cl. 368-82.000.

Komori, Fukutaro, to Komori Seisakusho Co., Ltd. Clutch disk for use in automobile. 4,202,432, Cl. 192-107.00M.

Komori Seisakusho Co., Ltd.: *See*—
Komori, Fukutaro, 4,202,432, Cl. 192-107.00M.

Kondo, Hideyo: *See*—
Fukuda, Tadaji; Kajita, Isamu; Misumi, Teruo; Kondo, Hideyo; and Kitajima, Nobuo, 4,202,937, Cl. 430-58.000.

Kondo, Toshio; Harada, Susumu; Ito, Nobuyuki; and Kobayashi, Nobuyuki, to Nippondenso Co., Ltd.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Fuel supply control system for internal combustion engines. 4,202,295, Cl. 123-32.0EH.

Konig, Dieter: *See*—
Anderl, Peter; Scheffels, Wilhelm; Steigerwald, Karl H.; Monch, Clauspeter; Koy, Johannes;; and Konig, Dieter, 4,203,021, Cl. 219-121.0EB.
Steigerwald, Karl-Heinz; Scheffels, Wilhelm; Anderl, Peter; Konig, Dieter; Hiller, Walther; and Rappold, Franz, 4,203,023, Cl. 219-121.0EB.

Konrad, Eugen: *See*—
Gross, Paul; Konrad, Eugen; and Mager, Herbert, 4,202,881, Cl. 424-70.000.

Kooi, J. Peter E., to Keuffel & Esser Company. Theodolite tangent screw system. 4,202,110, Cl. 33-299.000.

Kool, Bram: *See*—
Haning, James O.; Kool, Bram; Moritz, Jules G.; and Mizrahi, Robert, 4,202,613, Cl. 353-120.000.

Koppelmann, Gerhard: *See*—
Haunstetter, Franz; and Koppelmann, Gerhard, 4,203,032, Cl. 250-205.000.

Korb, Donald R.: *See*—
Becker, Ronald K.; and Korb, Donald R., 4,202,226, Cl. 82-12.000.

Korbanka, Helmut; and Scheidl, Franz, to Hoechst Aktiengesellschaft. Organotin halides. 4,202,830, Cl. 260-429.700.

Kornfeld, Edmund C.; and Bach, Nicholas J., to Eli Lilly and Company. 6-Ethyl(or allyl)-8-methoxymethyl or methylmercaptomethylergolines and related compounds. 4,202,979, Cl. 546-67.000.

Kortum, William M. Method and apparatus for inducing immunological and resistant response in mammary glands. 4,202,329, Cl. 128-130.000.

Kos, Peter, to Dorr-Oliver Incorporated. Flow distributor for fluid bed biological reactor. 4,202,774, Cl. 210-274.000.

Kos, Steven: *See*—
Naguib, Hussein M.; Baraff, David R.; and Kos, Steven, 4,203,119, Cl. 346-76.0PH.

Kosche, Horst, to Ciba-Geigy Corporation. Heat-sensitive recording or copying material. 4,202,566, Cl. 282-27.500.

Koschorke, Herbert: *See*—
Kaufmann, Friedrich; Weisenburger, Siegfried; Koschorke, Herbert; Seiffert, Hartmut; Sienel, Dieter; and Weiss, Karl-Heinz, 4,202,792, Cl. 252-301.10W.

Koshiba, Masao: *See*—
Yamamoto, Michihiro; Katayama, Shigenari; Koshiba, Masao; and Yamamoto, Hisao, 4,202,974, Cl. 544-251.000.

Koslowski, Gerhard, to W. Schlafhorst & Co. Thread braking device. 4,202,511, Cl. 242-150.00R.

Koster, Kari: *See*—
Reiner, Roland; Heide, Helmut; and Koster, Kari, 4,202,055, Cl. 3-1.910.

Koster, Sandra K.: *See*—
Wang, Chen-Shen; and Koster, Sandra K., 4,202,951, Cl. 525-416.000.

Kostka, Frank: *See*—
Anderson, David R.; Kostka, Frank; and Kostka, Frank J., 4,202,468, Cl. 221-93.000.

Kostka, Frank J.: *See*—
Anderson, David R.; Kostka, Frank; and Kostka, Frank J., 4,202,468, Cl. 221-93.000.

Kothe, Dieter: *See*—
Dangeleit, Siegfried; and Kothe, Dieter, 4,202,274, Cl. 104-165.000.

Kovac, Michael G.; Chleck, David J.; and Goodman, Philip, to Panametrics, Inc. Absolute humidity sensors and methods of manufacturing humidity sensors. 4,203,087, Cl. 338-35.000.

Kovacs, Donald J. Fishing rod holder with signal means. 4,202,125, Cl. 43-17.000.

Kovalenko, Jury A.: *See*—
Latash, Jury V.; Voronin, Alexei E.; Nikolaev, Vladimir A.; Pelts, Boris B.; Volokhonsky, Lev A.; Artemiev, Vladimir D.; Vlasov, Mikhail I.; Chernyak, Alexandr I.; Nikulin, Alexandr A.; Dub, Vladimir S.; Vasiliev, Yakov M.; Stul, Iosif N.; Mukha, Vitaly P.; Orlov, Gennady I.; Khasin, Kim M.; Naryshkin, Jury A.; Belsky, Valentin I; Veligura, Ilya L.; Bogdashich, Vladimir E.; Lisitsin, Vladimir A.; Mischenko, Alexandr V.; Kovalenko, Jury A.; Babin, Vladimir V.; Svitenko, Igor A.; Antonov, Vladimir I.; and Smolyarenko, Volemir D., 4,202,401, Cl. 164-252.000.

Koy, Johannes;: *See*—
Anderl, Peter; Scheffels, Wilhelm; Steigerwald, Karl H.; Monch, Clauspeter; Koy, Johannes;; and Konig, Dieter, 4,203,021, Cl. 219-121.0EB.

Kraft, Harold D.: *See*—
Kraft, Jack A.; and Kraft, Harold D., 4,202,634, Cl. 366-111.000.

Kraft, Jack A.; and Kraft, Harold D. Rack for vessels and means for agitating the vessels in the rack. 4,202,634, Cl. 366-111.000.

Kraftwerk Union Aktiengesellschaft: *See*—
Jung, Wilfried; Peehs, Martin; Rau, Peter; Krug, Wolfgang; and Stechemesser, Horst, 4,202,732, Cl. 176-37.000.
Simon, Ulrich; Werner, Klaus-Dieter; and Pontani, Bernd, 4,202,731, Cl. 176-37.000.

Kranzle, Josef. Multiple nozzle head. 4,202,495, Cl. 239-1.000.

Kraus, Richard A., to Chrysler Corporation. Electronic current sensor and controller for automatic power antenna. 4,203,059, Cl. 318-446.000.

Krauss-Maffei Aktiengesellschaft: *See*—
Fink, Eugen; and Ostermeyer, Peter, 4,202,773, Cl. 210-256.000.

Krehbiel, Vivian D., to Kreonite Inc. Masking device for cropping photographs viewed on a view screen of a photographic printer. 4,202,624, Cl. 355-45.000.

Kreonite Inc.: *See*—
Krehbiel, Vivian D., 4,202,624, Cl. 355-45.000.

Kristapovich, Paul J.; and Schiltz, Ronald M., to Crepaco, Inc. Apparatus for handling a plurality of articles. 4,202,436, Cl. 198-472.000.

Krogh, Georg. Silo. 4,202,147, Cl. 52-245.000.

Krolopp, Otto C.; and Haluch, Leonard M., to Prater Industries, Inc. Centrifugal screening apparatus. 4,202,759, Cl. 209-234.000.

Kron, Rudolf: *See*—
Klein, Alfons; Knust, Ernst; Kron, Rudolf; and Wedemeyer, Karl-fried, 4,203,145, Cl. 361-317.000.

Kroneisen, Armin, to Hartmann & Braun AG. Electrochemical measuring cell. 4,202,748, Cl. 204-195.00R.

Kropp, Donald E., to Ceramic Coating Company. Seal cartridge for agitator shaft of a chemical reactor. 4,202,553, Cl. 277-41.000.

Kroyer, Karl K. K. Method of preparing a sheet-formed product. 4,202,851, Cl. 264-113.000.

Krude, Werner; and Jordan, Alfons, to Uni-Cardan Aktiengesellschaft. Homokinetic universal joint assembly. 4,202,184, Cl. 64-32.00R.

Krug, Manfred: *See*—
Olschewski, Armin; Brandenstein, Manfred; Krug, Manfred; and Martin, Horst, 4,202,558, Cl. 280-11.280.

Krug, Wolfgang: *See*—
Jung, Wilfried; Peehs, Martin; Rau, Peter; Krug, Wolfgang; and Stechemesser, Horst, 4,202,732, Cl. 176-37.000.

Krupp-Koppers GmbH: *See*—
Durselen, Heinz; Onnebrink, Franz-Josef; and Schuffler, Arnulf, 4,202,735, Cl. 201-41.000.

Kruskopf, Hans G., to Mats Holersson Fridmark. Sequentially actuated flashing light apparatus. 4,203,091, Cl. 340-331.000.

Kuhn, Vincent R.: *See*—
Jacob, Jose T.; and Kuhn, Vincent R., 4,202,796, Cl. 252-389.00A.

Kula, Bernard, to Cooper-Weymouth, Peterson, Inc. Stock check and lead-in roll assembly. 4,202,478, Cl. 226-189.000.

Kulicke & Soffa Industries, Inc.: *See*—
Sade, Moshe E.; Soffa, Albert; Vilenski, Dan; and Wing, William, 4,202,482, Cl. 228-4.500.

Kulite Semiconductor Products, Inc.: *See*—
Kurtz, Anthony D.; and Mallon, Joseph R., 4,202,217, Cl. 73-727.000.

Kuraray Plastics, Co., Ltd.: *See*—
Mizutani, Tadashi; and Tachibana, Hiromichi, 4,202,718, Cl. 156-171.000.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Asano, Kiro; Saito, Tsuyoshi; Tanaka, Hiromitsu; and Enomoto, Satoru, 4,202,885, Cl. 424-95.000.
Sato, Masaki; Kawasaki, Takao; and Nagane, Yasushi, 4,202,877, Cl. 424-43.000.
Ueno, Saburo; Yoshikumi, Chikao; Hirose, Fumio; Omura, Yoshio; Wada, Toshihiko; Fujii, Takayoshi; and Takahashi, Eiichi, 4,202,969, Cl. 536-1.000.

Kuribayashi, Akio: *See*—
Shimada, Noburo; Miyamoto, Akira; Kobayashi, Motonobu; Kuribayashi, Akio; Toyoda, Takeharu; Kimura, Morihiro; Kyoden, Hiroshi; Hoshino, Toshisuke; and Watanabe, Jiro, 4,202,538, Cl. 266-275.000.

Kuroda, Nobuyuki: *See*—
Matsuura, Kazuo; Kuroda, Nobuyuki; Shiraishi, Takeichi; and Miyoshi, Mitsuji, 4,202,953, Cl. 526-125.000.

Kuroda, Ryozo: *See—*
Asai, Koichi; Kawada, Tohsuke; Iwaki, Yoshiyuki; and Kuroda, Ryozo, 4,202,196, Cl. 72-137.000.

Kuroki, Takashi: *See—*
Nakatani, Mitsuo; Kuroki, Takashi; Syozi, Toshiaki; and Horibe, Yoshiyuki, 4,203,025, Cl. 219-216.000.

Kurt Orban Company, Inc.: *See—*
Meyer, Charles R., 4,202,215, Cl. 73-599.000.

Kurtz, Anthony D.; and Mallon, Joseph R., to Kulite Semiconductor Products, Inc. Semiconductor transducers employing flat bondable surfaces with buried contact areas. 4,202,217, Cl. 73-727.000.

Kusch, Sergei A.: *See—*
Klimkovsky, Bronislav M.; Azikov, Boris A.; Zemtsov, Mikhail U.; Kusch, Sergei A.; and Nalivkin, Nikolai P., 4,202,439, Cl. 198-642.000.

Kushigian, Anthony. Grinding wheel dresser. 4,202,317, Cl. 125-11.00H.

Kusters, Eduard: *See—*
Gruber, Heinz, 4,202,188, Cl. 68-205.00R.

Kuus, Gijsbert, to U.S. Philips Corporation. Electric lamp with hydrogen getter and hydrogen getter. 4,203,049, Cl. 313-174.000.

Kuwabara, Yuzo: *See—*
Abe, Akira; Kimura, Shoji; and Kuwabara, Yuzo, 4,202,348, Cl. 128-680.000.

Kuznetsov, Albert P.: *See—*
Golyanovsky, Anton V.; and Kuznetsov, Albert P., 4,202,156, Cl. 56-13.600.

Kuznetsov, German N.: *See—*
Grigorenko, Anatoly S.; Moroz, Jury A.; Kuznetsov, German N.; Vimba, Vladimir I.; Landyshev, Vladimir V.; Bocharov, Jury A.; and Safonov, Anatoly V., 4,202,174, Cl. 60-413.000.

Kuznetsov, Sergei L.: *See—*
Vydrin, Vladimir N.; Dukmasov, Vladimir G.; Davlyatshin, Garifulla; and Kuznetsov, Sergei L., 4,202,197, Cl. 72-245.000.

Kvamsdal, Rolf, to Moss Rosenberg Verft A/S. Floating plant for offshore liquefaction, temporary storage and loading of LNG. 4,202,648, Cl. 405-210.000.

Kyoden, Hiroshi: *See—*
Shimada, Noburo; Miyamoto, Akira; Kobayashi, Motonobu; Kuribayashi, Akio; Toyoda, Takeharu; Kimura, Morihiro; Kyoden, Hiroshi; Hoshino, Toshisuke; and Watanabe, Jiro, 4,202,538, Cl. 266-275.000.

Kyorin Pharmaceutical Co., Ltd.: *See—*
Irikura, Tsutomu; and Suzue, Seigo, 4,202,977, Cl. 544-362.000.

Kyowa Hakko Kogyo, Co. Ltd.: *See—*
Terada, Osamu; Uwajima, Takayuki; Mihara, Akira; Aisaka, Kazuo; Akita, Hiroko; Nagai, Toshiaki; and Shimizu, Yoshiaki, 4,202,941, Cl. 435-190.000.

Lamb, Jeffrey W. Fuel conservation controller for heating and refrigeration apparatus. 4,202,181, Cl. 62-141.000.

Lammers, Gerald B.; and Ritchie, Robert T., to International Business Machines Corporation. Apparatus for handling flexible sheet material of different sizes. 4,202,542, Cl. 271-276.000.

Lampson, Butler W.; Sproull, Robert F.; Ornstein, Severo M.; and Leung, James Y., to Xerox Corporation. Electronic image processing system. 4,203,154, Cl. 364-200.000.

Lamy, Jacques E. Buoyant base for marine platforms. 4,202,647, Cl. 405-203.000.

Landau, Michael B.: *See—*
Reiser, Carl A.; and Landau, Michael B., 4,202,933, Cl. 429-13.000.

Landyshev, Vladimir V.: *See—*
Grigorenko, Anatoly S.; Moroz, Jury A.; Kuznetsov, German N.; Vimba, Vladimir I.; Landyshev, Vladimir V.; Bocharov, Jury A.; and Safonov, Anatoly V., 4,202,174, Cl. 60-413.000.

Langer, Alois A.; Heilman, Marlin S.; Mower, Morton M.; and Mirowski, Mieczyslaw, to Mirowski, Mieczyslaw. Method and apparatus for monitoring heart activity, detecting abnormalities, and cardioverting a malfunctioning heart. 4,202,340, Cl. 128-419.00D.

Larking, Ingrid: *See—*
Moretto, Hans-Heinrich; de Montigny, Armand; Steinberger, Helmut; Sattlegger, Hans; and Larking, Ingrid, 4,202,807, Cl. 260-29.1SB.

Larsen, Steven T.: *See—*
Guckel, Henry; and Larsen, Steven T., 4,203,128, Cl. 357-60.000.

Larson, Keith J. Saw guide device. 4,202,233, Cl. 83-745.000.

Laska, Friedrich, to Imperial Chemical Industries Limited. Cutting tool assembly for meat mincer. 4,202,502, Cl. 241-82.500.

Latash, Jury V.; Voronin, Alexei E.; Nikolaev, Vladimir A.; Pelts, Boris B.; Volokhonsky, Lev A.; Artemiev, Vladimir D.; Vlasov, Mikhail I.; Chernyak, Alexandr I.; Nikulin, Alexandr A.; Dub, Vladimir S.; Vasiliev, Yakov M.; Stul, Iosif N.; Mukha, Vitaly P.; Orlov, Gennady I.; Khasin, Kim M.; Naryshkin, Jury A.; Belsky, Valentin I; Veligura, Ilya L.; Bogdashich, Vladimir E.; Lisitsin, Vladimir A.; Mischenko, Alexandr V.; Kovalenko, Jury A.; Babin, Vladimir V.; Svitenko, Igor A.; Antonov, Vladimir I.; and Smolyarenko, Volemir D. Apparatus for electroslag casting of heavy ingots. 4,202,401, Cl. 164-252.000.

Lauton, Alain; Putzar, Roland; Berendt, Hans-Ulrich; and Scherer, Gustaaf, to Ciba-Geigy Corporation. Sulphonated condensation products. 4,202,838, Cl. 260-505.00C.

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Coulter, Alton R.; Hubbard, Lonnie G.; Johnston, Vincent P.; and Rich, Michael H., 4,202,145, Cl. 52-169.100.

Le Can, Claude J. P. F.; and van den Beemt, Johannes A. C., to U.S. Philips Corporation. Integrated circuit. 4,203,042, Cl. 307-241.000.

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Lester, Frank R.; and Bullard, James, to Nuvite Chemical Compounds Corporation. Portable scrubbing tool. 4,202,068, Cl. 15-28.000.

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Gruber, Bruce A.; and Lorenz, Donald H., 4,202,834, Cl. 260-465.00D.
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Galperin, Alexandr L.; Serebryannikov, Albert S.; Onikov, Eduard A.; Zabotin, Alexandr A.; Loschilin, Evgeny D.; and Santucci, Nicola, 4,202,383, Cl. 139-436.000.

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Ogawa, Koichi; Tezuka, Shichigoro; Sato, Yoshinori; Moroe, Michio; Tsuruta, Haruki; and Yoshida, Toshio, 4,202,906, Cl. 426-3.000.

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Thompson, George H. B.; and Lovelace, David F., 4,203,079, Cl. 331-94.50H.

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Mowbray, Dorian F., 4,202,303, Cl. 123-139.0AQ.
Skinner, Barrie C., 4,202,308, Cl. 123-179.00G.

Lucas, Stephen J. Decorative drumstick system with different appearing inserts. 4,202,241, Cl. 84-422.00S.

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Johnson, Jay P.; Parrack, Alvin L.; and Lunsford, Delbert R., 4,203,161, Cl. 367-40.000.

Lurie, David. Process for the desulfurization of flue gases. 4,202,869, Cl. 423-563.000.

Luther, Hans W.; and Marwitz, Hartmut, to Rheinmetall GmbH. Stub case obturator. 4,202,270, Cl. 102-43.00R.

Lutrat, Jacques. Single cycle rotary engine with constant fuel feeding. 4,202,315, Cl. 123-249.000.

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Heymes, Rene; and Lutz, Andre, 4,202,893, Cl. 424-246.000.

Lybecker, Robert W.: *See*—
Gunkel, Walter A.; and Lybecker, Robert W., 4,202,490, Cl. 235-449.000.

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Mager, Herbert: *See*—
Gross, Paul; Konrad, Eugen; and Mager, Herbert, 4,202,881, Cl. 424-70.000.

Magnetic Controls Company: *See*—
Buck, Josef J., 4,203,066, Cl. 324-51.000.

Magnuson Engineers, Inc.: *See*—
Lawson, William J., 4,202,261, Cl. 99-636.000.

Mahler, Gert: *See*—
Viertel, Lothar; Mahler, Gert; and Nowak, Manfred, 4,203,149, Cl. 362-144.000.

Maier, Karl: *See*—
Jurisch, Wilhelm; Greune, Christian; and Maier, Karl, 4,202,171, Cl. 60-39.28R.

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Malcolm, Alexander R. Deferred action dry cell battery. 4,202,935, Cl. 429-48.000.

Malinak, Frank J., to Western States Machine Company, The. Depither. 4,202,078, Cl. 19-26.000.

Mallinckrodt, Inc.: *See*—
Farley, Max F.; and Dutton, Edmund L., 4,203,096, Cl. 340-538.000.

Mallon, Joseph R.: *See*—
Kurtz, Anthony D.; and Mallon, Joseph R., 4,202,217, Cl. 73-727.000.

Maloof, Ralph P. Propeller fan blading and hub therefor. 4,202,655, Cl. 416-237.000.

Manevy, Georges: *See*—
Bourgeois, Michel; Manevy, Georges; and Roux, Jean-Pierre, 4,202,861, Cl. 423-19.000.

Mang, Josef; and Waters, Robert W., to Emerson Electric Co. Automatic reciprocating, indexing and picking assembly apparatus. 4,202,435, Cl. 198-339.000.

Mangano, Joseph A.: *See*—
Daugherty, Jack D.; Jacob, Jonah H.; and Mangano, Joseph A., 4,203,078, Cl. 331-94.5PE.

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Hill, Robin E. T.; Mann, Alan W.; McDonald, Ean L.; and Perdrix, John L., 4,202,128, Cl. 43-43.140.

Manning, John J., to RMR Systems, Inc. Pool alarm device. 4,203,097, Cl. 340-566.000.

Mar, Jerry: *See*—
Frohman-Bentchkowsky, Dov; Mar, Jerry; Perlegos, George; and Johnson, William S., 4,203,158, Cl. 365-185.000.

Marcovich, Herbert S.; and Perrin, Remi D., to Institut Pasteur. Process and apparatus for the thorough purification of water and the highly purified water obtained thereby. 4,202,736, Cl. 203-10.000.

Marcy Tool Company: *See*—
Marcyan, Stanley T., 4,202,062, Cl. 5-66.000.

Marcyan, Stanley T., to Marcy Tool Company. Knock-down invalid bed. 4,202,062, Cl. 5-66.000.

Marek, Larry L. Noise making lure. 4,202,127, Cl. 43-42.310.

Margotte, Werner: *See*—
Renner, Alfred; and Margotte, Werner, 4,202,920, Cl. 427-386.000.

Maris, George; and Nelson, Carl G. Display device. 4,202,121, Cl. 40-152.100.

Marlow, Alfred S. Wear resistant self lubricating centrifugal pump. 4,202,654, Cl. 415-113.000.

Martignani, Giovanni: *See*—
Bezzi, Giovanni; Facchini, Alessandro; Martignani, Giovanni; and Pastore, Michele, 4,202,793, Cl. 252-301.10S.

Martin, Dean W.: *See*—
Hooker, James A.; Martin, Dean W.; and Williamson, Shellie O., 4,202,224, Cl. 81-3.00R.

Martin, Harry M., Sr. Crab peeler. 4,202,077, Cl. 17-73.000.

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Olschewski, Armin; Brandenstein, Manfred; Krug, Manfred; and Martin, Horst, 4,202,558, Cl. 280-11.280.

Martin, John R. Web tensioning apparatus for a hostile fluid bath. 4,202,476, Cl. 226-119.000.

Martner, Glen R.: *See*—
Allen, Richard T.; Moyer, Rudolph H.; Sibbett, Donald J.; Anderson, Howard H.; Martner, Glen R.; and Willis, Don, 4,202,212, Cl. 73-421.50R.

Marumoto, Ryuji; Furukawa, Yoshiyasu; and Kawai, Kiyohisa, to Takeda Chemical Industries, Ltd. Isoxazolo[3,4-d]pyrimidines. 4,202,975, Cl. 544-255.000.

Maruyama, Hiromi: *See*—
Suhara, Yasuji; Maruyama, Hiromi; Itoh, Sayuri; and Yokose, Kazuteru, 4,202,943, Cl. 435-280.000.

Maruzen Petrochemical Co., Ltd.: *See*—
Hayashi, Kiyoshige; Nakagawa, Masanao; Ozaki, Kazuo; and Ito, Yoshiharu, 4,202,868, Cl. 423-445.000.

Marvin Glass & Associates: *See*—
Morrison, Howard J., 4,202,134, Cl. 46-92.000.

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Luther, Hans W.; and Marwitz, Hartmut, 4,202,270, Cl. 102-43.00R.

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Keiczek, Hubert, 4,202,500, Cl. 239-533.300.

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Masson, Bernard: *See*—
Rabilloud, Guy; Masson, Bernard; Giuliani, Pierre; and Sillion, Bernard, 4,202,960, Cl. 528-271.000.

Massoubre, Jean-Marie, to Compagnie Generale des Etablissements Michelin. Continuous solution polymerization process. 4,202,954, Cl. 526-181.000.

Masterman, Hugh C.: *See—*
Chambers, Derek; and Masterman, Hugh C., 4,203,055, Cl. 315-375.000.

Masuda, Teruo; Watanabe, Nobuhiko; Abe, Takeo; Koike, Matsuhiro; Morita, Masayasu; Oguma, Yoshio; Hamaguchi, Yoshiharu; Hirata, Motonobu; Saito, Mamoru; Onoguchi, Kunio; Yamaguchi, Kazuyuki; and Hirose, Akira, to France Bed Co., Ltd. Cooking apparatus. 4,202,257, Cl. 99-348.000.

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Mathews, Lester R. Swimming pool cleaner. 4,202,499, Cl. 239-206.000.

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Kruskopf, Hans G., 4,203,091, Cl. 340-331.000.

Matsufuji, Akira: *See—*
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Matsuishi, Masanori: *See—*
Washizuka, Isamu; Teramura, Satoshi; and Matsuishi, Masanori, 4,202,607, Cl. 350-338.000.

Matsumoto, Seiji; Koga, Tadashi; Fukai, Kiyoshi; and Nakatani, Shinya, to Sakai Chemical Industry Co., Ltd. Production of acicular ferric oxide. 4,202,871, Cl. 423-632.000.

Matsumoto, Sigeru, to Victor Company of Japan, Limited. Solenoid actuated control system. 4,202,220, Cl. 74-471.00R.

Matsumoto, Teruo: *See—*
Takahashi, Toshiyori; Ojima, Akihiro; Matsumoto, Teruo; and Kashiwakura, Koji, 4,203,038, Cl. 250-507.000.

Matsunaga, Hirotsugu: *See—*
Ohtake, Sadao; Hayashida, Shuji; Matsunaga, Hirotsugu; and Kaimori, Michinobu, 4,202,186, Cl. 68-3.00R.

Matsuno, Koichiro: *See—*
Hirai, Masataka; and Matsuno, Koichiro, 4,202,475, Cl. 225-2.000.

Matsushita Electric Industrial Co., Ltd.: *See—*
Minakuchi, Hiroshi, 4,203,061, Cl. 318-490.000.
Ohnishi, Masanori, 4,202,091, Cl. 29-527.100.
Shibasaki, Hatsuhiko; Omura, Junishi; Tanabe, Tetsuo; and Takamori, Kazumi, 4,202,092, Cl. 29-741.000.
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Yoshimura, Susumu; Murakami, Mutsuaki; and Shinoda, Midori, 4,202,799, Cl. 252-500.000.

Matsuura, Kazuo; Kuroda, Nobuyuki; Shiraishi, Takeichi; and Miyoshi, Mitsuji, to Nippon Oil Co., Ltd. Process for the production of polyolefins. 4,202,953, Cl. 526-125.000.

Matsuura, Ryo; Komatsu, Tatsuyoshi; Nomiyama, Yukio; and Usui, Kenji, to Kawasaki Kasei Chemicals Limited. Process for separation of naphthoquinone and phthalic acid. 4,202,828, Cl. 260-396.00R.

Matuyama, Takesi: *See—*
Yoshida, Norio; and Matuyama, Takesi, 4,202,806, Cl. 260-23.0XA.

Matyas, Stephen M.: *See—*
Ehrsam, William F.; Elander, Robert C.; Matyas, Stephen M.; Meyer, Carl H. W.; Sahulka, Richard J.; and Tuchman, Walter L., 4,203,166, Cl. 375-2.000.

Maurer, Fritz; Hammann, Ingeborg; and Behrenz, Wolfgang, to Bayer Aktiengesellschaft. Combating arthropods with O-alkyl-O-(6-alkoxy-2-cyclopropyl-pyrimidin-4-yl)-(thiono)(thiol)-phosphoric (phosphonic) acid esters or ester-amides. 4,202,889, Cl. 424-200.000.

Maxwell, Richard F., Jr., to United States of America, Army. Two tone tracker. 4,202,515, Cl. 244-3.110.

Mayer, George L., Jr.; and Schick, John D., to A Patent Partnership. Signature verification and authentication systems. 4,202,626, Cl. 355-52.000.

Mays, Steven L.: *See—*
Clarke, Ralph H.; Clarke, W. James; and Mays, Steven L., 4,202,677, Cl. 55-378.000.

McAdam, Raymond L.: *See—*
Bradley, Timothy G.; and McAdam, Raymond L., 4,202,910, Cl. 426-423.000.

McCarty, Glen L.: *See—*
Hughes, Theodore R.; and McCarty, Glenn L., 4,202,720, Cl. 156-353.000.

McCarty, Glenn L.: *See—*
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McCollough, John K., Jr.: *See—*
Addis, Kenneth J.; and McCollough, John K., Jr., 4,202,189, Cl. 68-205.00R.

McComas, Ralph J. Indicator and control device for PC boards. 4,203,148, Cl. 361-399.000.

McCormick, Joseph R. Supporting rack for breakable articles. 4,202,452, Cl. 211-41.000.

McCown, Donald P.: *See—*
Beck, John W.; and McCown, Donald P., 4,203,137, Cl. 360-31.000.

McDonald, Ean L.: *See—*
Hill, Robin E. T.; Mann, Alan W.; McDonald, Ean L.; and Perdrix, John L., 4,202,128, Cl. 43-43.140.

McElroy, Robert P.: *See—*
Klavan, Irving L.; Calabrese, Peter J.; Finch, Theron R.; Greenberg, Arthur; and McElroy, Robert P., 4,202,620, Cl. 355-10.000.
Klavan, Irving L.; Calabrese, Peter J.; Finch, Theron R.; Greenberg, Arthur; and McElroy, Robert P., 4,202,913, Cl. 430-106.000.

McGregor, Kenneth: *See—*
Henbest, Richard G. C.; and McGregor, Kenneth, 4,202,959, Cl. 528-254.000.

McGuire, Joseph C.: *See—*
Brehm, William F.; and McGuire, Joseph C., 4,202,730, Cl. 176-37.000.

McIntyre, Robert A.: *See—*
Smith, Leland B.; McIntyre, Robert A.; and Pawlak, Raymond M., 4,202,354, Cl. 128-731.000.

McKamie, William F.: *See—*
Sada, Charles A.; and McKamie, William F., 4,202,427, Cl. 182-2.000.

McLaren, Edwin C., to Champion International Corporation. Divided food container. 4,202,465, Cl. 220-468.000.

McLaughlin, William: *See—*
Zweig, Jack; McLaughlin, William; and Herz, Matthew L., 4,202,323, Cl. 128-1.100.

McLean, Kenneth W., to Sperry Rand Corporation. Safety lock for agricultural windrower or the like. 4,202,422, Cl. 180-6.480.

McMaster, Harold A.; and Nitschke, John S. Vacuum holder system and method for use in bending glass. 4,202,681, Cl. 65-104.000.

McNamara, Joseph R. Chimney cap. 4,202,255, Cl. 98-42.00R.

McSpadden, Larry W. Shell reloader with automatic ejection. 4,202,245, Cl. 86-36.000.

Mear, Brian; and Smith, Gary. Combined formwork and cavity tray. 4,202,143, Cl. 52-97.000.

Mechanical Enterprises, Incorporated: *See—*
Twyford, Robert H., 4,203,016, Cl. 200-159.00R.

Medi-Ray, Inc.: *See—*
Farella, Ralph; Dansky, Barry; and Epifano, Leonard, 4,202,345, Cl. 128-654.000.

Mee, Alec, to Imperial Chemical Industries Limited. Production of glycols. 4,202,995, Cl. 568-860.000.

Meiji Seika Kaisha, Ltd.: *See—*
Ohba, Kazunori; Shomura, Takashi; Ogawa, Yasuaki; Tsuruoka, Takashi; Watanabe, Hiroshi; Hisamatsu, Takashi; Uchida, Shingo; Kojima, Michio; and Inouye, Shigeharu, 4,202,886, Cl. 424-122.000.
Tamura, Gakuzo; and Takatsuki, Akira, 4,202,968, Cl. 536-23.000.

Mendels, Morton: *See—*
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Shen, Tsung-Ying; and Jones, Howard, 4,202,903, Cl. 424-326.000.

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Petros, Andrew J., 4,202,198, Cl. 72-250.000.

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Meyer, Charles R., to Kurt Orban Company, Inc. Sonic pulse-echo method and apparatus for determining attenuation coefficients. 4,202,215, Cl. 73-599.000.

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Haning, James O.; Kool, Bram; Moritz, Jules G.; and Mizrahi, Robert, 4,202,613, Cl. 353-120.000.

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Milliken Research Corporation: *See*—
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Lesley, Bascum G., 4,202,185, Cl. 66-203.000.
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Annett, Leland W., 4,202,480, Cl. 227-8.000.
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Mitsubishi Chemical Industries, Ltd.: *See*—
Yamaguchi, Kazuo; Tanaka, Toru; Okano, Shigeaki; Enokido, Nobuo; and Suzuki, Masatoshi, 4,202,958, Cl. 526-142.000.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Asai, Koichi; Kawada, Tohsuke; Iwaki, Yoshiyuki; and Kuroda, Ryozo, 4,202,196, Cl. 72-137.000.
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Shimizu, Senzo; Nomura, Isao; and Harada, Masahiro, 4,202,965, Cl. 528-499.000.
Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
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Mitsubishi Kasei Kogyo Kabushiki Kaisha: *See*—
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Mitsubishi Rayon Company, Limited: *See*—
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Mitsui Coke Co., Ltd.: *See*—
Murakami, Hisashi; Ohtsubo, Toshikatsu; Fukuda, Kenji; and Ohnishi, Noriaki, 4,202,756, Cl. 208-8.0LE.
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Asai, Yoshiyuki; Makiguchi, Nobuyoshi; Arita, Masanobu; Nakamura, Mitsuyoshi; and Sasa, Kozo, 4,202,905, Cl. 426-1.000.
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Miyake, Tetsuya; Ogawa, Norito; Asano, Motohisa; and Okuyama, Kazuo, to Asahi Kasei Kogyo Kabushiki Kaisha. Continuous separation of uranium isotopes. 4,202,860, Cl. 423-6.000.
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Miyauchi, Shizuya, to Koito Manufacturing Company Limited. Remotely controlled mirrors. 4,202,603, Cl. 350-289.000.
Miyoshi, Kazuhito: *See*—
Takahashi, Gensho; Miyoshi, Kazuhito; and Tanaka, Yoneharu, 4,202,696, Cl. 430-306.000.
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Mizutani, Tadashi; and Tachibana, Hiromichi, to Kuraray Plastics, Co., Ltd. Method of and apparatus of manufacturing a fiber-reinforced pressure hose. 4,202,718, Cl. 156-171.000.
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Mochalov, Vyacheslav N.: *See*—
Smirnov, Boris A.; Busygin, Valery P.; Komina, Lidia S.; Mochalov, Vyacheslav N.; Shagalov, Lev V.; and Gruzdev, Evgeny A., 4,202,314, Cl. 128-218.00F.
Mogler, Joachim, to Datograf Apparatebau GmbH & Co. Stoppers for pressure containers. 4,202,463, Cl. 220-307.000.
Mohs, Thomas J.; and Engel, Richard C., Jr., to Placon Corporation. Recloseable container. 4,202,464, Cl. 220-339.000.
Molins Machine Company, Inc.: *See*—
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Monkovic, Ivo; Bachand, Carol; and Wong, Henry, to Bristol-Myers Company. Process for the preparation of 14-hydroxymorphinan derivatives. 4,202,982, Cl. 546-89.000.
Monks, Reginald; and Riley, Anthony L. M., to Radiochemical Centre Limited, The. Investigating body function. 4,202,876, Cl. 424-1.500.
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Howse, Paul T., Jr.; and Wilkie, Arnold E., 4,202,854, Cl. 264-168.000.
Williamson, Alex N., 4,202,837, Cl. 260-465.900.
Monte, Salvatore J.; and Sugerman, Gerald, to Kenrich Petrochemicals, Inc. Application of cumylphenol and derivatives thereof in plastic compositions. 4,202,810, Cl. 260-31.20N.
Moog, Robert A., to Norlin Industries, Inc. Compressor-expander for a musical instrument. 4,202,238, Cl. 84-1.270.
Mookherjee, Braja D.: *See*—
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Mooney, John J.: *See*—
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Michael, Keith W.; and Moore, Alvin L., 4,202,811, Cl. 260-37.0SB.

Moore, William T., to Rank Organisation Limited, The. Optical scanning system with compensation for unwanted image rotation during scanning. 4,202,597, Cl. 350-6.600.

Moran, John C., to Bell Telephone Laboratories, Incorporated. Method and structure for detecting recycling of polynomial counters. 4,203,030, Cl. 235-92.0CC.

Moraw, Roland; and Schadlich, Gunther, to Hoechst Aktiengesellschaft. Recording material having intersecting conductive strips and apertured spacing means. 4,202,693, Cl. 430-50.000.

Moretto, Hans-Heinrich; de Montigny, Armand; Steinberger, Helmut; Sattlegger, Hans; and Larking, Ingrid, to Bayer Aktiengesellschaft. Organopolysiloxane compositions modified with polyurethane. 4,202,807, Cl. 260-29.1SB.

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Mori, Kazuo: *See*—
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Mori, Kouichi; Igashira, Toshihiko; and Yamaguchi, Shunzo, to Toyota Jidosha Kogyo Kabushiki Kaisha. Ignition device for rotary piston engine. 4,202,312, Cl. 123-210.000.

Mori, Toshiro: *See*—
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Morinaga, Mitsuyoshi, to Trio Kabushiki Kaisha. Stereo lead wires and arrangements thereof for connecting pick-up device to amplifier. 4,202,550, Cl. 274-23.00R.

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Masuda, Teruo; Watanabe, Nobuhiko; Abe, Takeo; Koike, Matsuhiro; Morita, Masayasu; Oguma, Yoshio; Hamaguchi, Yoshiharu; Hirata, Motonobu; Saito, Mamoru; Onoguchi, Kunio; Yamaguchi, Kazuyuki; and Hirose, Akira, 4,202,257, Cl. 99-348.000.
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Moriya, Kazuo: *See*—
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Moriyoshi, Hiroshi, to Toyo Kogyo Co., Ltd. Means for resiliently connecting an oil pan to an engine body. 4,202,311, Cl. 123-195.00C.

Moroe, Michio: *See*—
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Moroz, Jury A.: *See*—
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Acheson, Willard P.; Morris, Richard A.; and Viswanathan, Thiagarajan, 4,202,169, Cl. 60-39.120.

Morrison, Howard J., to Marvin Glass & Associates. Water toy. 4,202,134, Cl. 46-92.000.

Mortell Company: *See*—
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Moser, Bernhard: *See*—
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Moser, Paul; and Rody, Jean, to Ciba-Geigy Corporation. Novel light stabilizers. 4,202,816, Cl. 260-45.75N.

Moser, Roland: *See*—
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Moss, Milton: *See*—
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Moss Rosenberg Verft A/S: *See*—
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Motoren- und Turbinen-Union GmbH: *See*—
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Mowbray, Dorian F., to Lucas Industries Limited. Fuel systems for compression ignition engines. 4,202,303, Cl. 123-139.0AQ.

Mower, Morton M.: *See*—
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M'Sadoques, Andre J.: *See*—
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Mueller, Nancy J.; and Holik, Dennis J., to CPC International Inc. Glucoamylase immobilized on cationic colloidal silica. 4,202,939, Cl. 435-96.000.

Mueller, Thomas L. Movable golf green apparatus. 4,202,547, Cl. 273-181.00A.

Mukha, Vitaly P.: *See*—
Latash, Jury V.; Voronin, Alexei E.; Nikolaev, Vladimir A.; Pelts, Boris B.; Volokhonsky, Lev A.; Artemiev, Vladimir D.; Vlasov, Mikhail I.; Chernyak, Alexandr I.; Nikulin, Alexandr A.; Dub, Vladimir S.; Vasiliev, Yakov M.; Stul, Iosif N.; Mukha, Vitaly P.; Orlov, Gennady I.; Khasin, Kim M.; Naryshkin, Jury A.; Belsky, Valentin I; Veligura, Ilya L.; Bogdashich, Vladimir E.; Lisitsin, Vladimir A.; Mischenko, Alexandr V.; Kovalenko, Jury A.; Babin, Vladimir V.; Svitenko, Igor A.; Antonov, Vladimir I.; and Smolyarenko, Volemir D., 4,202,401, Cl. 164-252.000.

Muller-Bardorff, Wolfgang: *See*—
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Muller, Fritz; Kenner, Jurgen; and Schadlich, Wolfgang, to Muller, Fritz. Valve. 4,202,526, Cl. 251-51.000.

Muller, Hans, to Grapha-Holding AG. Apparatus for trimming stacks of paper sheets or the like. 4,202,232, Cl. 83-519.000.

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Furst, Andor; Keller, Peter; and Muller, Marcel, 4,202,823, Cl. 260-343.600.

Muller, Siegfried. Cable sleeve assembly. 4,203,000, Cl. 174-92.000.

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Multon, Francois; and Aliain, Gerard, to Ultraflux. Ultrasonic flow meter for gases. 4,202,210, Cl. 73-194.00A.

Muncheryan, Hrand M. Device for preventing dozing while driving a car. 4,203,098, Cl. 340-575.000.

Murakami, Fumiki; Teshima, Soichi; and Yokoyama, Toshihiko, to Mitsubishi Rayon Company, Limited. Process for producing unsaturated carboxylic acid esters. 4,202,990, Cl. 560-217.000.

Murakami, Hisashi; Ohtsubo, Toshikatsu; Fukuda, Kenji; and Ohnishi, Noriaki, to Mitsui Mining Co., Ltd.; and Mitsui Coke Co., Ltd. Process for the production of solvent-refined coal useful as starting material for other carbonaceous products. 4,202,756, Cl. 208-8.0LE.

Murakami, Mutsuaki: *See*—
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Murayama, Hideaki: *See*—
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Murayama, Kentaro; and Nakano, Kazuyuki, to Sankin Industry Co., Ltd. Low melting point Ni-Cr alloy for cast dental products. 4,202,687, Cl. 75-134.00C.

Murray, James B. Patient lifting device. 4,202,063, Cl. 5-81.00R.

Murray, Milton C., to Dow Corning Corporation. Silicone rubber compositions containing extending fillers and acryloxyalkylsilanes. 4,202,812, Cl. 260-37.0SB.

Musa, Fuad H.: *See*—
Daniels, R. Gary; Musa, Fuad H.; Wilder, W. Bryant, Jr.; Wiles, Michael F.; and Bennett, Thomas H., 4,203,157, Cl. 364-788.000.

Nagai, Toshiaki: *See*—
Terada, Osamu; Uwajima, Takayuki; Mihara, Akira; Aisaka, Kazuo; Akita, Hiroko; Nagai, Toshiaki; and Shimizu, Yoshiaki, 4,202,941, Cl. 435-190.000.

Nagane, Yasushi: *See*—
Sato, Masaki; Kawasaki, Takao; and Nagane, Yasushi, 4,202,877, Cl. 424-43.000.

Nagasawa, Masahiro: *See*—
Tsukamoto, Masahide; Nagasawa, Masahiro; and Yamazoe, Hiroshi, 4,203,082, Cl. 333-194.000.

Nagashima, Akira, to Kioritz Corporation. Portable chain saw. 4,202,096, Cl. 30-381.000.
Nagoya Kiko Kabushiki Kaisha: *See—*
Niki, Akira, 4,202,440, Cl. 198-718.000.
Naguib, Hussein M.; Baraff, David R.; and Kos, Steven, to Northern Telecom Limited. Thermal printers. 4,203,119, Cl. 346-76.0PH.
Nagy, Louis E.: *See—*
Hirsch, Leon C.; Rawson, Paul O.; and Nagy, Louis E., 4,202,353, Cl. 128-724.000.
Nahory, Robert E.: *See—*
Gordon, James P.; Nahory, Robert E.; Pollack, Martin A.; and Worlock, John M., 4,203,124, Cl. 357-13.000.
Naito, Takeshi; and Kibayashi, Yasutada, to Kabushiki Kaisha Komatsu Seisakusho. Carburization of ferrous alloys. 4,202,710, Cl. 148-16.500.
Nakagawa, Masanao: *See—*
Hayashi, Kiyoshige; Nakagawa, Masanao; Ozaki, Kazuo; and Ito, Yoshiharu, 4,202,868, Cl. 423-445.000.
Nakajima, Koe: *See—*
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Nakajima, Yasuo; Hayashi, Yoshimasa; and Yoshimura, Tooru, to Nissan Motor Company, Limited. Multi-point spark ignition engine provided with exhaust recirculation circuit. 4,202,306, Cl. 123-148.00C.
Nakakura, Kenji: *See—*
Shibayama, Toshiyuki; and Nakakura, Kenji, 4,202,391, Cl. 152-209.00D.
Nakamura, Akio: *See—*
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Nakamura, Mitsuyoshi: *See—*
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Nakane, Masanori: *See—*
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Nakanishi Dental Mfg., Co., Ltd.: *See—*
Nakanishi, Takasuke, 4,202,102, Cl. 433-127.000.
Nakanishi, Takasuke, to Nakanishi Dental Mfg., Co., Ltd. Device for opening and closing a chuck for a dental handpiece. 4,202,102, Cl. 433-127.000.
Nakano, Kazuyuki: *See—*
Murayama, Kentaro; and Nakano, Kazuyuki, 4,202,687, Cl. 75-134.00C.
Nakatani, Mitsuo; Kuroki, Takashi; Syozi, Toshiaki; and Horibe, Yoshiyuki, to Hitachi, Ltd. Thick-film thermal printing head. 4,203,025, Cl. 219-216.000.
Nakatani, Shinya: *See—*
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Nakazawa, Kazutada: *See—*
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Nalivkin, Nikolai P.: *See—*
Klimkovsky, Bronislav M.; Azikov, Boris A.; Zemtsov, Mikhail U.; Kusch, Sergei A.; and Nalivkin, Nikolai P., 4,202,439, Cl. 198-642.000.
Namiki, Naokuni, to Slidex Corporation. Self-supporting unitary plate for holding photographic slides. 4,202,122, Cl. 40-158.00B.
Namiki, Yasushi; Terashima, Akira; and Yoshizawa, Naomi, to Pilot Man-Nen Hitsu Kabushiki Kaisha. Electronic musical box. 4,202,235, Cl. 84-1.010.
Naryshkin, Jury A.: *See—*
Latash, Jury V.; Voronin, Alexei E.; Nikolaev, Vladimir A.; Pelts, Boris B.; Volokhonsky, Lev A.; Artemiev, Vladimir D.; Vlasov, Mikhail I.; Chernyak, Alexandr I.; Nikulin, Alexandr A.; Dub, Vladimir S.; Vasiliev, Yakov M.; Stul, Iosif N.; Mukha, Vitaly P.; Orlov, Gennady I.; Khasin, Kim M.; Naryshkin, Jury A.; Belsky, Valentin I; Veligura, Ilya L.; Bogdashich, Vladimir E.; Lisitsin, Vladimir A.; Mischenko, Alexandr V.; Kovalenko, Jury A.; Babin, Vladimir V.; Svitenko, Igor A.; Antonov, Vladimir I.; and Smolyarenko, Volemir D., 4,202,401, Cl. 164-252.000.
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National Mine Service Company: *See—*
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National Research Development Corporation: *See—*
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National Steel Corporation: *See—*
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Near, Charles W.: *See—*
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Neefe, Charles W. Method of making bifocal contact lenses. 4,202,848, Cl. 264-1.000.
Neff, Lawrence M. Bar-type clamp. 4,202,540, Cl. 269-166.000.
Nelson, Carl G.: *See—*
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Nemoto, Kazuyuki, to Olympus Optical Co., Ltd. Single lens reflex camera with electrical shutter. 4,202,615, Cl. 354-152.000.
Nesmeyanov, Alexandr N.; Rogozhin, Sergei V.; Tolstoguzov, Vladimir B.; Misjurev, Vladimir I.; Ershova, Vera A.; and Braudo, Evgeny E., to Institut Elementoorganicheskih Soedineny. Synthetic, granular food caviar and method of preparing same. 4,202,908, Cl. 426-72.000.
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Neumann, Eckart: *See—*
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New York Institute of Technology: *See—*
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Newell, Richard G.; and Perry, Dale C., to Minnesota Mining and Manufacturing Company. Corrosion resistance treatment of aluminum with N-alkyl-fluoroaliphaticsulfonamidophosphonic acids and salts thereof. 4,202,706, Cl. 148-6.170.
Newkirk, Lawrence R.; and Valencia, Flavio A., to United States of America, Energy. Superconducting articles of manufacture and method of producing same. 4,202,931, Cl. 428-662.000.
Nichols, Philip T.: *See—*
Watts, Paul J.; Crawford, Lynn D.; and Nichols, Philip T., 4,202,363, Cl. 135-2.000.
Nicholson, Thomas F., Jr. Level layer winding method and apparatus. 4,202,512, Cl. 242-157.100.
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Spiegelman, Gerald H.; Nickles, Harry B.; and Solomon, Jack M., 4,202,755, Cl. 208-5.000.
Nielsen, Ralph H.: *See—*
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Nihon Repro Machine Kogyo Kabushiki Kaisha: *See—*
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Niki, Akira, to Nagoya Kiko Kabushiki Kaisha. Apparatus for accumulating materials on a shuttle conveyor. 4,202,440, Cl. 198-718.000.
Nikolaev, Vladimir A.: *See—*
Latash, Jury V.; Voronin, Alexei E.; Nikolaev, Vladimir A.; Pelts, Boris B.; Volokhonsky, Lev A.; Artemiev, Vladimir D.; Vlasov, Mikhail I.; Chernyak, Alexandr I.; Nikulin, Alexandr A.; Dub, Vladimir S.; Vasiliev, Yakov M.; Stul, Iosif N.; Mukha, Vitaly P.; Orlov, Gennady I.; Khasin, Kim M.; Naryshkin, Jury A.; Belsky, Valentin I; Veligura, Ilya L.; Bogdashich, Vladimir E.; Lisitsin, Vladimir A.; Mischenko, Alexandr V.; Kovalenko, Jury A.; Babin, Vladimir V.; Svitenko, Igor A.; Antonov, Vladimir I.; and Smolyarenko, Volemir D., 4,202,401, Cl. 164-252.000.
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Nippon Gakki Seizo Kabushiki Kaisha: *See—*
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Nippon Jidoseigyo Ltd.: *See—*
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Nippon Kokan Kabushiki Kaisha: *See—*
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Nippon Oil Co., Ltd.: *See—*
Matsuura, Kazuo; Kuroda, Nobuyuki; Shiraishi, Takeichi; and Miyoshi, Mitsuji, 4,202,953, Cl. 526-125.000.
Nippon Soken, Inc.: *See—*
Sowa, Kunihiro; and Esaki, Motoharu, 4,203,094, Cl. 340-378.500.
Nippon Steel Corporation: *See—*
Haneda, Yoshikazu; Yamamoto, Yoshun; Matsufuji, Akira; Haji, Takashi; and Nakajima, Koe, 4,202,192, Cl. 72-21.000.
Nippon Telegraph and Telephone Public Corp.: *See—*
Hirai, Masataka; and Matsuno, Koichiro, 4,202,475, Cl. 225-2.000.
Nippon Zeon Co., Ltd.: *See—*
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Kondo, Toshio; Harada, Susumu; Ito, Nobuyuki; and Kobayashi, Nobuyuki, 4,202,295, Cl. 123-32.0EH.
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Nishikoori, Tsutomu, to Toyo Kogyo Co., Ltd. Locking means for automobile rear doors. 4,202,571, Cl. 292-216.000.
Nishio, Yukihiro: *See—*
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Nissan Motor Company, Limited: *See—*
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Nixdorf, Hans W.; and Tolle, Gunther, to ever clean GmbH H. W. Nixdorf. Window cleaning apparatus. 4,202,069, Cl. 15-250.030.

Nogami, Yoichi: *See*—
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Nomiyama, Yukio: *See*—
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Nomura, Isao: *See*—
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Kominami, Naoya; Fukumi, Hirokazu; Yamawaki, Naokuni; and Nomura, Junji, 4,202,291, Cl. 119-3.000.

Nonnenmann, Manfred; Hauser, Kurt; and Schwarz, Gebhard, to Sud-deutsche Kuhlerfabrik Julius Fr. Behr GmbH & Co. K.G. Cooling system for internal combustion engines. 4,202,296, Cl. 123-41.480.

Noonan, John M.: *See*—
Merrill, Stewart H.; Hartman, Susan E.; Noonan, John M.; Sandhu, Mohammad A.; and Santilli, Domenic, 4,202,785, Cl. 430-106.000.

Norlin Industries, Inc.: *See*—
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North American Philips Corporation: *See*—
Dalisa, Andrew L.; and Singer, Barry M., 4,203,106, Cl. 340-787.000.

Northern Telecom Limited: *See*—
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Nossen, Edward J., to RCA Corporation. Code correlator loop using arithmetic synthesizer. 4,203,002, Cl. 375-116.000.

Novo Industri A/S: *See*—
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Nowak, Manfred: *See*—
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NP Industries, Inc.: *See*—
Perry, Jack A., 4,202,211, Cl. 73-227.000.

Nuss, James W., to Ferro Corporation. Inorganic pigment comprising a solid solution of differing spinels. 4,202,702, Cl. 106-288.00B.

Nuvite Chemical Compounds Corporation: *See*—
Lester, Frank R.; and Bullard, James, 4,202,068, Cl. 15-28.000.

Obinata, Akira, to Fuji Photo Film Co., Ltd. Rotary cutter. 4,202,230, Cl. 83-345.000.

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Occidental Oil Shale, Inc.: *See*—
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O'Connor, Paul J.: *See*—
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Oda, Denichi: *See*—
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Oda, Yoshio; Suhara, Manabu; Goto, Shoziro; Hukushima, Takashi; Miura, Koji; and Hamano, Toshikatsu, to Asahi Glass Company, Limited. Electrolysis of aqueous solution of sodium chloride. 4,202,743, Cl. 204-98.000.

Odawara, Youji: *See*—
Shimizu, Norio; and Odawara, Youji, 4,202,763, Cl. 210-14.000.

Ogawa, Koichi; Tezuka, Shichigoro; Sato, Yoshinori; Moroe, Michio; Tsuruta, Haruki; and Yoshida, Toshio, to Lotte Co., Ltd.; and Takasago Perfumery Co., Ltd. Chewing gum base containing a thermally decomposed product of a natural rubber and a method of preparation thereof. 4,202,906, Cl. 426-3.000.

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Ogawa, Yasuaki: *See*—
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Ogawa, Yoshishige: *See*—
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Ogino, Yasuo: *See*—
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Oguma, Yoshio: *See*—
Masuda, Teruo; Watanabe, Nobuhiko; Abe, Takeo; Koike, Matsuhiro; Morita, Masayasu; Oguma, Yoshio; Hamaguchi, Yoshiharu; Hirata, Motonobu; Saito, Mamoru; Onoguchi, Kunio; Yamaguchi, Kazuyuki; and Hirose, Akira, 4,202,257, Cl. 99-348.000.

O'Hara, Mark J.; Johnson, Russell W.; and Hilfman, Lee, to UOP Inc. Hydroprocessing of hydrocarbons. 4,202,758, Cl. 208-143.000.

O'Hare, David H.; Brickell, Christopher G.; and Spilman, Lindsay G., to Fisher & Paykel Limited. Electrically heated humidifying apparatus. 4,203,027, Cl. 219-275.000.

Ohba, Kazunori; Shomura, Takashi; Ogawa, Yasuaki; Tsuruoka, Takashi; Watanabe, Hiroshi; Hisamatsu, Takashi; Uchida, Shingo; Kojima, Michio; and Inouye, Shigeharu, to Meiji Seika Kaisha, Ltd. Antibiotic SF-1942 substance and process for production of the same. 4,202,886, Cl. 424-122.000.

Ohmura, Taizo; Yonezawa, Noboru; and Ikuta, Kazuo, to Mitsubishi Kinzoku Kabushiki Kaisha. Process for manufacturing fine powder of metal. 4,202,686, Cl. 75-0.50B.

Ohnishi, Masanori, to Matsushita Electric Industrial Co. Ltd. Method of manufacturing a hybrid framework consisting of metallic plate and projection made of synthetic resin. 4,202,091, Cl. 29-527.100.

Ohnishi, Noriaki: *See*—
Murakami, Hisashi; Ohtsubo, Toshikatsu; Fukuda, Kenji; and Ohnishi, Noriaki, 4,202,756, Cl. 208-8.0LE.

Ohno, Eiji; and Chikugo, Kazuo, to Kabushiki Kaisha Komatsu Seisakusho. Method for the production of sintered powder ferrous metal preform. 4,202,689, Cl. 75-211.000.

Ohtake, Sadao; Hayashida, Shuji; Matsunaga, Hirotsugu; and Kaimori, Michinobu, to Kanebo Limited. Apparatus for dyeing a bundle of fibers such as a sliver or top. 4,202,186, Cl. 68-3.00R.

Ohtsubo, Toshikatsu: *See*—
Murakami, Hisashi; Ohtsubo, Toshikatsu; Fukuda, Kenji; and Ohnishi, Noriaki, 4,202,756, Cl. 208-8.0LE.

Ohtsuka, Kunio: *See*—
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Ojima, Akihiro: *See*—
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Okamoto, Toyoo, to Ricoh Company, Ltd. Corona charger for image transfer. 4,203,144, Cl. 361-234.000.

Okano, Shigeaki: *See*—
Yamaguchi, Kazuo; Tanaka, Toru; Okano, Shigeaki; Enokido, Nobuo; and Suzuki, Masatoshi, 4,202,958, Cl. 526-142.000.

Oktay, Sevgin; Torgersen, Gerard J.; and Wong, Alexander C., to International Business Machines Corporation. Bubble generating tunnels for cooling semiconductor devices. 4,203,129, Cl. 357-82.000.

Oku, Yuji; and Tsuyama, Yasuharu, to Yamaha Hatsudoki Kabushiki Kaisha. Two-stroke engine having variable exhaust port timing. 4,202,297, Cl. 123-65.0PE.

Okuyama, Kazuo: *See*—
Miyake, Tetsuya; Ogawa, Norito; Asano, Motohisa; and Okuyama, Kazuo, 4,202,860, Cl. 423-6.000.

Olevsky, Viktor M.: *See*—
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Olin Corporation: *See*—
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Crane, Jacob; Shapiro, Eugene; Shapiro, Stanley; and Mravic, Brian, 4,202,688, Cl. 75-153.000.
Preston, Frank J.; and Chandalia, Kiran B., 4,202,947, Cl. 521-174.000.

Olschewski, Armin; Brandenstein, Manfred; Krug, Manfred; and Martin, Horst, to SKF Kugellagerfabriken GmbH. Support body for rollers of skating devices. 4,202,558, Cl. 280-11.280.

Olson, James D. Bolt pattern gauge. 4,202,106, Cl. 33-168.00R.

Olympus Optical Co., Ltd.: *See*—
Kamachi, Shinichi; and Gocho, Nagahiro, 4,203,031, Cl. 250-201.000.
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Sato, Masaaki, 4,203,048, Cl. 310-268.000.

Omron Tateisi Electronics Co.: *See*—
Abe, Akira; Kimura, Shoji; and Kuwabara, Yuzo, 4,202,348, Cl. 128-680.000.

Omura, Junishi: *See*—
Shibasaki, Hatsuhiko; Omura, Junishi; Tanabe, Tetsuo; and Takamori, Kazumi, 4,202,092, Cl. 29-741.000.

Omura, Yoshio: *See*—
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Onikov, Eduard A.: *See*—
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Onizawa, Masao, to Sanyo Trading Co., Ltd. Method of vulcanizing bromobutyl rubber with amino acids. 4,202,952, Cl. 525-374.000.

Onnebrink, Franz-Josef: *See*—
Durselen, Heinz; Onnebrink, Franz-Josef; and Schuffler, Arnulf, 4,202,735, Cl. 201-41.000.

Ono, Hiroshi; Saida, Toyoyasu; and Fukumura, Kunimitsu. Process for removing oil particles from waste water containing the same. 4,202,766, Cl. 210-40.000.

Onoguchi, Kunio: *See*—
Masuda, Teruo; Watanabe, Nobuhiko; Abe, Takeo; Koike, Matsuhiro; Morita, Masayasu; Oguma, Yoshio; Hamaguchi, Yoshiharu; Hirata, Motonobu; Saito, Mamoru; Onoguchi, Kunio; Yamaguchi, Kazuyuki; and Hirose, Akira, 4,202,257, Cl. 99-348.000.

Opfer, John C.; and Vojta, Karel E., to S & C Electric Company. Operating mechanism for a circuit interrupting device. 4,203,083, Cl. 335-174.000.

Oplinger, Terry R. Stackable furniture modules having replaceable panels. 4,202,586, Cl. 312-107.000.

Orcutt, Roger P., to Charles River Breeding Laboratories, Inc., The. Vaccine for Tyzzer's disease in rabbits. 4,202,883, Cl. 424-92.000.

Orlov, Gennady I.: *See*—
Latash, Jury V.; Voronin, Alexei E.; Nikolaev, Vladimir A.; Pelts, Boris B.; Volokhonsky, Lev A.; Artemiev, Vladimir D.; Vlasov, Mikhail I.; Chernyak, Alexandr I.; Nikulin, Alexandr A.; Dub, Vladimir S.; Vasiliev, Yakov M.; Stul, Iosif N.; Mukha, Vitaly P.; Orlov, Gennady I.; Khasin, Kim M.; Naryshkin, Jury A.; Belsky, Valentin I; Veligura, Ilya L.; Bogdashich, Vladimir E.; Lisitsin, Vladimir A.; Mischenko, Alexandr V.; Kovalenko, Jury A.; Babin, Vladimir V.; Svitenko, Igor A.; Antonov, Vladimir I.; and Smolyarenko, Volemir D., 4,202,401, Cl. 164-252.000.

Ornstein, Severo M.: *See*—
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Orr, Brian A. Overfill preventive funnel. 4,202,386, Cl. 141-300.000.

Ortho Diagnostics, Inc.: *See*—
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Ortlepp, Hans: *See*—
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Bates, John F.; and Popplewell, James M., 4,202,708, Cl. 148-11.50C.

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Wocher, Berthold; and Pfendler, Thomas, 4,203,112, Cl. 343-13.00R.
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Rohrig, Adalbert, to Concast AG. Transfer device for billets and blooms of a multistrand continuous casting installation for metals. 4,202,402, Cl. 164-263.000.
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Rose, Larry A. Air circulation system. 4,202,492, Cl. 236-49.000.

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Rumell, James A. Rail mounting method and apparatus. 4,202,494, Cl. 238-83.000.

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Rusay, Ronald J., to Stauffer Chemical Company. 2-1-(2-Hydroxy alkyl imino)-ethyl-1-hydroxy-4,4,6,6-tetramethyl cyclohexen-3,5-diones. 4,202,685, Cl. 71-121.000.

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Ruskin, Arnold M., to Occidental Oil Shale, Inc. Thermally metamorphosing oil shale to inhibit leaching. 4,202,412, Cl. 166-256.000.

Russo, Leonard. Dental plate cushion. 4,202,098, Cl. 433-168.000.

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Rutten, Pierre L.; and Danel. Francois H., to Compagnie Nationale d'Amenagement de la Region du Bas-Rhone et du Languedoc; and Assistance Industrielle Dauphinoise S.A. Volumetric valve with independent display and resetting. 4,202,467, Cl. 222-20.000.

Ruuskanen, Erkki. Refiner. 4,202,505, Cl. 241-247.000.

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S & C Electric Company: *See—*
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S.I.C.E. Societa Italiana Costruzioni Elettromeccaniche S.p.A.: *See—*
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S & S Corrugated Paper Machinery Co., Inc.: *See—*
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Sabol, Albert R.; and Baughman, Ernest H., to Standard Oil Company (Indiana). Process for making molybdenum phosphosulfurized hydrocarbon composition. 4,202,781, Cl. 252-32.7HC.

Sachs, Klaus, to Anton Piller KG. Battery/mains generator set for the production of interruption-free current. 4,203,041, Cl. 307-67.000.

Sacks, Alvin H. Method and apparatus for determining blood pressure. 4,202,347, Cl. 128-677.000.

Sada, Charles A.; and McKamie, William F., to Santa Fe International Corporation. Derrick escape system. 4,202,427, Cl. 182-2.000.

Sade, Moshe E.; Soffa, Albert; Vilenski, Dan; and Wing, William, to Kulicke & Soffa Industries, Inc. Solenoid actuated wire feed and tearing apparatus. 4,202,482, Cl. 228-4.500.

Sado, Ryoichi; and Nakamura, Akio, to Shin-Etsu Polymer Co., Ltd. Pressure-sensitive multiple resistor elements. 4,203,088, Cl. 338-114.000.

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St. Jean, William A. Lathe tool holder. 4,202,651, Cl. 407-91.000.

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Saito, Mamoru: *See—*
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Sandhu, Mohammad A.: *See—*
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Saridakis, Nikolaus, to Volkswagenwerk Aktiengesellschaft. Positive cobalt electrode for alkaline storage batteries and process for its production. 4,202,789, Cl. 252-182.100.

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Sashin, Donald: *See—*
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Sato, Hisato; Takatsu, Haruyoshi; and Tazume, Masayuki, to Dainippon Ink & Chemicals Inc. Nematic liquid crystalline materials. 4,202,791, Cl. 252-299.000.

Sato, Makoto; Takamatsu, Hiroshi; Miyagawa, Yoshitaka; and Fujii, Etsuo, to Honda Giken Kogyo Kabushiki Kaisha. Anti-skid brake control device and associated method. 4,202,584, Cl. 303-105.000.

Sato, Masaaki, to Olympus Optical Co., Ltd. Coil support for disc rotor of coreless motor. 4,203,048, Cl. 310-268.000.
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Scharpf, Mike A. Apparatus for washing and drying phonograph records. 4,202,071, Cl. 15-302.000.
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Schertz, Charles W.; and Ritter, Edward H., to General Dynamics Pomona Division. Multiple co-axial optical sight and closed loop gun control system. 4,202,246, Cl. 89-41.0EA.
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Schmitt, Franz: *See*—
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Schneider, Louis; and Graham, David E., to GAF Corporation. N-(N'-Methylenepyrrolidonyl)-2-substituted anilines. 4,202,821, Cl. 260-326.50S.
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Schnek, Arthur G.; Looze, Yvan-Roger-Jean; and Deconinck, Marc M., to Prospa S.A. Derivative of lysozyme. 4,202,884, Cl. 424-94.000.
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Schulte, Heinrich, to Lindemann Maschinenfabrik GmbH. Scrap shearing machines. 4,202,263, Cl. 100-95.000.
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SCI Systems, Inc.: *See*—
King, Olin B., 4,203,120, Cl. 346-162.000.
King, Olin B., 4,203,121, Cl. 346-162.000.
King, Olin B., 4,203,122, Cl. 346-162.000.
Scott & Fetzer Company, The: *See*—
Cox, Frank H., 4,202,180, Cl. 62-50.000.
Seiberling, Mildred Kelley: *See*—
Seiberling, Theophilus K., 4,202,717, Cl. 156-136.000.
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Kaufmann, Friedrich; Weisenburger, Siegfried; Koschorke, Herbert; Seiffert, Hartmut; Sienel, Dieter; and Weiss, Karl-Heinz, 4,202,792, Cl. 252-301.10W.
Seip, Donald P.: *See*—
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Seiz, Wolfgang: *See*—
Habermeier, Jurgen; Moser, Roland; and Seiz, Wolfgang, 4,202,987, Cl. 560-49.000.
Seki, Nagataka, to Tokyo Shibaura Electric Co., Ltd. Gate circuit of gate turn-off thyristor. 4,203,047, Cl. 307-252.00C.
Seltman, Irving E. Cycle safety disc. 4,202,582, Cl. 301-37.0SA.
Semikron Gesellschaft fur Gleichrichterbau und Elektronik m.b.H: *See*—
Chadda, Madan M., 4,202,916, Cl. 427-82.000.
Serebryannikov, Albert S.: *See*—
Galperin, Alexandr L.; Serebryannikov, Albert S.; Onikov, Eduard A.; Zabotin, Alexandr A.; Loschilin, Evgeny D.; and Santucci, Nicola, 4,202,383, Cl. 139-436.000.
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Beck, Manfred; Schnetger, Jochen; Serini, Volker; and Pampus, Gottfried, 4,202,949, Cl. 525-92.000.
Serras-Paulet, Edouard. Alphanumeric control keyboard with depressible keys for electric or electronic machines. 4,203,013, Cl. 200-5.00A.
Shafranovsky, Alexandr V.; Olevsky, Viktor M.; Chubukov, Vladimir K.; Baskov, Jury A.; and Dmitriev, Konstantin V. Rotor film appara-

tus for processes with participation of liquid and gas. 4,202,846, Cl. 261-142.000.

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Smirnov, Boris A.; Busygin, Valery P.; Komina, Lidia S.; Mochalov, Vyacheslav N.; Shagalov, Lev V.; and Gruzdev, Evgeny A., 4,202,314, Cl. 128-218.00F.

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Bonk, Henry W.; and Shah, Tilak M., 4,202,957, Cl. 528-77.000.

Shambhu, Manvendra B.: *See—*
Digenis, George A.; and Shambhu, Manvendra B., 4,202,356, Cl. 131-10.900.

Shamlian, Ralph B. Rechargeable modular component light with quick-disconnect connection. 4,203,150, Cl. 362-183.000.

Shanks, Roy R., to Burroughs Corporation. Thin film memory device employing amorphous semiconductor materials. 4,203,123, Cl. 357-2.000.

Shanks, Scott B.: *See—*
Richter, Gerolf; and Shanks, Scott B., 4,203,019, Cl. 219-72.000.

Shanley, Robert L., II: *See—*
Harwood, Leopold A.; Wittmann, Erwin J.; and Shanley, Robert L., II, 4,203,131, Cl. 358-34.000.

Shapiro, Eugene: *See—*
Crane, Jacob; Shapiro, Eugene; Shapiro, Stanley; and Mravic, Brian, 4,202,688, Cl. 75-153.000.

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Batjukov, Vladimir I.; Vijugov, Oleg N.; Fadeev, Alexandr I.; Shapkin, Alexandr F.; and Dyatlov, Lev E., 4,202,727, Cl. 176-30.000.

Sharp Kabushiki Kaisha: *See—*
Washizuka, Isamu; Teramura, Satoshi; and Matsuishi, Masanori, 4,202,607, Cl. 350-338.000.

Sharp, Keith W.; and Sparlin, Derry D., to Baker International Corporation. Acid soluble coating for well screens. 4,202,411, Cl. 166-244.00C.

Shawl, Edward T., to Atlantic Richfield Company. Preparation of diphenylmethane dicarbamates and polymethylene polyphenyl carbamates with Lewis acid catalysts intercalated in graphite. 4,202,986, Cl. 560-25.000.

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Lazaridis, Lazaros J.; Miskolczy, Gabor; and Shefsiek, Paul K., 4,202,661, Cl. 432-8.000.

Sheldon, Loren B.; Tomashek, James R.; and Ward, Donald H. Power tongs control arrangement. 4,202,225, Cl. 81-57.350.

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Schuurman, Pieter J., 4,202,672, Cl. 48-77.000.

Shell Oil Company: *See—*
Carr, John B.; and Durham, Harry G., 4,202,902, Cl. 424-298.000.
Durham, Harry G.; and Carr, John B., 4,202,818, Cl. 548-204.000.

Shelley, Edwin F., to New York Institute of Technology. Solar air conditioning apparatus and method. 4,202,179, Cl. 62-2.000.

Shelton, David L., to Procter & Gamble Company, The. Three phase antiperspirant stick. 4,202,879, Cl. 424-66.000.

Shen, Tsung-Ying; and Jones, Howard, to Merck & Co., Inc. Acyl cyanoguanidines for treating rheumatoid arthritis. 4,202,903, Cl. 424-326.000.

Shepard, Franziska M. Low voltage distribution system for miniature structure. 4,203,053, Cl. 315-254.000.

Sherwood, William G.; Hodges, Donald R.; and Nikolic, Cvetko, to Amax Inc. Cell with multiple anode-cathode chambers for fluid bed electrolysis. 4,202,752, Cl. 204-222.000.

Shibamori, Seiji; and Ishida, Yoji, to Furukawa Aluminum Co., Ltd. Method for manufacturing aluminum or aluminum alloy clad steel sheet or strip. 4,202,709, Cl. 148-11.50Q.

Shibasaki, Hatsuhiko; Omura, Junishi; Tanabe, Tetsuo; and Takamori, Kazumi, to Matsushita Electric Industrial Co., Ltd. Automatic part insertion machine. 4,202,092, Cl. 29-741.000.

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Shields, James E., to Eli Lilly and Company. Peptides related to somatostatin. 4,202,802, Cl. 260-8.000.

Shikuma, Masao: *See—*
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Shimada, Noburo; Miyamoto, Akira; Kobayashi, Motonobu; Kuribayashi, Akio; Toyoda, Takeharu; Kimura, Morihiro; Kyoden, Hiroshi; Hoshino, Toshisuke; and Watanabe, Jiro, to Nippon Kokan Kabushiki Kaisha. Casting vessel having basic lining and usage thereof. 4,202,538, Cl. 266-275.000.

Shimano Industrial Company Limited: *See—*
Ishida, Takuo; and Ban, Masuo, 4,202,508, Cl. 242-84.20G.

Shimizu, Hiroshi, to Rohm and Haas Company. Ion exchange process for desalination. 4,202,737, Cl. 210-32.000.

Shimizu, Katsuichi: *See—*
Kawatsura, Yoshihiro; Shimizu, Katsuichi; and Sakamaki, Hisashi, 4,202,622, Cl. 355-14.00C.
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Shimizu, Norio; and Odawara, Youji, to Hitachi, Ltd. High-efficient activated sludge method. 4,202,763, Cl. 210-14.000.

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Shimizu, Yoshiaki: *See—*
Terada, Osamu; Uwajima, Takayuki; Mihara, Akira; Aisaka, Kazuo; Akita, Hiroko; Nagai, Toshiaki; and Shimizu, Yoshiaki, 4,202,941, Cl. 435-190.000.

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Shin-Etsu Polymer Co., Ltd.: *See—*
Sado, Ryoichi; and Nakamura, Akio, 4,203,088, Cl. 338-114.000.

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Shiraishi, Takeichi: *See—*
Matsuura, Kazuo; Kuroda, Nobuyuki; Shiraishi, Takeichi; and Miyoshi, Mitsuji, 4,202,953, Cl. 526-125.000.

Shlepakov, Valery N.: *See—*
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Shomura, Takashi: *See—*
Ohba, Kazunori; Shomura, Takashi; Ogawa, Yasuaki; Tsuruoka, Takashi; Watanabe, Hiroshi; Hisamatsu, Takashi; Uchida, Shingo; Kojima, Michio; and Inouye, Shigeharu, 4,202,886, Cl. 424-122.000.

Shriver, Joe E.: *See—*
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Condon, Denis M., 4,203,001, Cl. 178-3.000.
Ebensberger, Matthaus; Hesse, Jurgen; and Raab, Lothar, 4,203,068, Cl. 324-97.000.
Haunstetter, Franz; and Koppelmann, Gerhard, 4,203,032, Cl. 250-205.000.
Heinzl, Joachim; Kern, Hans; and Giebler, Fritz, 4,202,267, Cl. 101-364.000.
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Sienel, Dieter: *See—*
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Signoretto, Teresio. Rubber composition containing ground graminaceous rice product especially for manufacturing molded panels. 4,202,803, Cl. 260-17.4BB.

Silber, David. Toy utilizing used, discardable items such as bottle caps and beverage cans. 4,202,456, Cl. 215-228.000.

Siler, Ethel J. Doll. 4,202,135, Cl. 46-154.000.

Siliconix, Inc.: *See—*
Yim, Ernest W.; and VanLoon, Paul G. G., 4,203,126, Cl. 357-42.000.

Sillars, Frederick S., to USM Corporation. Can body conveyor with anti-rotation mechanism. 4,202,483, Cl. 228-43.000.

Sillion, Bernard: *See—*
Rabilloud, Guy; Masson, Bernard; Giuliani, Pierre; and Sillion, Bernard, 4,202,960, Cl. 528-271.000.

Silver Engineering Works, Inc.: *See—*
Price, Frank B.; and Vertenstein, Mathieu J., 4,202,527, Cl. 251-58.000.

Silverhardt, Stephen: *See—*
Zall, Michael E.; and Silverhardt, Stephen, 4,202,103, Cl. 433-153.000.

Simon, Ulrich; Werner, Klaus-Dieter; and Pontani, Bernd, to Kraftwerk Union Aktiengesellschaft. Condensation tube for a blow-off device for limiting excess pressure in nuclear power plants, especially in boiling water nuclear power plants. 4,202,731, Cl. 176-37.000.

Simpson, Neville H.; and Dykeman, Fred E., to Amsted Industries Incorporated. Lubricated plastic impregnated aramid fiber rope. 4,202,164, Cl. 57-232.000.

Singer, Barry M.: *See—*
Dalisa, Andrew L.; and Singer, Barry M., 4,203,106, Cl. 340-787.000.

Singer Company, The: *See—*
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Sinoto, Nori. Pop-open container lid. 4,202,461, Cl. 220-268.000.

Sippel, Nathan J.; Hiser, Earl J.; and Christy, John, to United States of America, Navy. Gelled fuel simulant. 4,202,668, Cl. 44-7.00A.

Siragusa, Epifanio A. Collar construction. 4,202,054, Cl. 2-116.000.

Sitka, Hans-Peter: *See—*
Armbruster, Franz; Paoli, Albano; Bassler, Gerd; Sitka, Hans-Peter; and Schmidt, Gunter, 4,203,020, Cl. 219-93.000.

Sjostedt, Lars L. Loose-leaf binder utilizing stiff covers. 4,202,642, Cl. 402-13.000.

Skay, Frank. Internal combustion engine. 4,202,300, Cl. 123-75.00B.

SKF Kugellagerfabriken GmbH: *See—*
Olschewski, Armin; Brandenstein, Manfred; Krug, Manfred; and Martin, Horst, 4,202,558, Cl. 280-11.280.

Skimovex B.V: *See—*
Middelbeek, Cornelis G., 4,202,778, Cl. 210-522.000.
Skinner, Barrie C., to Lucas Industries Limited. Internal combustion engine system. 4,202,308, Cl. 123-179.00G.
Skinner, Edward A., to Avdel Limited. Fault detector. 4,202,191, Cl. 72-10.000.
Skoda, oborovy podnik: *See—*
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Skrzec, Adam E.: *See—*
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Slepchuk, Valery A.: *See—*
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SMG Suddeutsche Maschinenbau-Gesellschaft mbH: *See—*
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Smirnov, Boris A.; Busygin, Valery P.; Komina, Lidia S.; Mochalov, Vyacheslav N.; Shagalov, Lev V.; and Gruzdev, Evgeny A. Device for injection of medicinal preparations. 4,202,314, Cl. 128-218.00F.
Smith, Curtis P.; and Ulrich, Henri, to Upjohn Company, The. Mixture of bis(2-hydroxyalkyl) N,N-di(lower alkyl)aminomethanephosphonates with polyols. 4,202,779, Cl. 252-8.100.
Smith, Curtis P.; and Ulrich, Henri, to Upjohn Company, The. Fire retardant polyurethanes prepared from hydroxy substituted aminomethanephosphonates. 4,202,946, Cl. 521-169.000.
Smith, Dennis D., to Illinois Tool Works Inc. Temperature-sensitive spiral spring sliding contact device. 4,203,086, Cl. 337-410.000.
Smith, Edward E., to Geode Industries, Inc. Bezel grinding attachment for a dop stick holder. 4,202,138, Cl. 51-229.000.
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Smith, Gerald E. Bridge pin. 4,202,240, Cl. 84-297.00R.
Smith International, Inc.: *See—*
Aither, George A., 4,202,417, Cl. 175-320.000.
Smith, Leland B.; McIntyre, Robert A.; and Pawlak, Raymond M., to Beckman Instruments, Inc. Electroencephalograph. 4,202,354, Cl. 128-731.000.
Smith, Terry G. Amusement device. 4,202,130, Cl. 46-1.00R.
Smith, Thomas H.: *See—*
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Snow Machines, Inc.: *See—*
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Societe Anonyme dite: Ela Medical: *See—*
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Societe d'Etudes et d'Applications Technologiques-Serat: *See—*
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Societe d'Usinage des Tubes pour l'Electricite S.U.T.E.: *See—*
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Solid Photography Inc.: *See—*
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Watanabe, Yoshimi, 4,203,140, Cl. 360-77.000.
Yamashita, Noriyuki, 4,203,076, Cl. 331-25.000.
Sorenson, Conrad L. Trailer hitch. 4,202,562, Cl. 280-415.00R.
Soto, Jose M. Land vehicle with articulated legs. 4,202,423, Cl. 180-8.00D.
Soundesign Corporation: *See—*
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Soussloff, Dimitri G., to Trantorque Corporation. Mounting device. 4,202,644, Cl. 403-369.000.
Southard, James S.; and Mott, Daniel R., to C. G. Conn, Ltd. Tone generator keyer control system. 4,202,239, Cl. 84-1.260.
Sowa, Kunihiro; and Esaki, Motoharu, to Nippon Soken, Inc. Apparatus for selectively displaying a plurality of indication panels. 4,203,094, Cl. 340-378.500.
Sowter, Brian R., to International Business Machines Corporation. Correction factor signals for cathode ray tubes. 4,203,054, Cl. 315-368.000.
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Sparks, Ward L.: *See—*
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Spevack, Jerome S., to Deuterium Corporation. Process for controlling environmental pollution from steam containing hydrogen sulfide. 4,202,864, Cl. 423-220.000.
Spiegelman, Gerald H.; Nickles, Harry B.; and Solomon, Jack M., to Witco Chemical Corp. Catalytic method for making pitch. 4,202,755, Cl. 208-5.000.
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Standard Oil Company of Indiana: *See—*
Wang, Chen-Shen; and Koster, Sandra K., 4,202,951, Cl. 525-416.000.
Stanish, Walter F. Retractable pet leash. 4,202,510, Cl. 242-107.40R.
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den Hartog, Huibert; Stann, Klaus; and Stolze, Lutz, 4,202,194, Cl. 72-78.000.
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Stauffer Chemical Company: *See—*
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Steigerwald, Karl H.: *See—*
Anderl, Peter; Scheffels, Wilhelm; Steigerwald, Karl H.; Monch, Clauspeter; Koy, Johannes;; and Konig, Dieter, 4,203,021, Cl. 219-121.0EB.

Steigerwald, Karl-Heinz; Scheffels, Wilhelm; Anderl, Peter; Konig, Dieter; Hiller, Walther; and Rappold, Franz, to Steigerwald Strahltechnik GmbH. Welding pool support device for energy beam welding. 4,203,023, Cl. 219-121.0EB.

Steigerwald Strahltechnik GmbH: *See—*
Anderl, Peter; Scheffels, Wilhelm; Steigerwald, Karl H.; Monch, Clauspeter; Koy, Johannes;; and Konig, Dieter, 4,203,021, Cl. 219-121.0EB.
Steigerwald, Karl-Heinz; Scheffels, Wilhelm; Anderl, Peter; Konig, Dieter; Hiller, Walther; and Rappold, Franz, 4,203,023, Cl. 219-121.0EB.

Stein, Herbert: *See—*
Mills, Harold; and Stein, Herbert, 4,202,344, Cl. 128-644.000.

Steinberger, Helmut: *See—*
Moretto, Hans-Heinrich; de Montigny, Armand; Steinberger, Helmut; Sattlegger, Hans; and Larking, Ingrid, 4,202,807, Cl. 260-29.1SB.

Steinkamp, Walter: *See—*
Tuschy, Eckhard; Wischmeyer, Georg; and Steinkamp, Walter, 4,202,195, Cl. 72-78.000.

Steller, Kenneth E., to Hercules Incorporated. Peroxide blends. 4,202,790, Cl. 252-186.000.

Stellner, Klaus: *See—*
Batz, Hans-Georg; Stellner, Klaus; Linke, Hans-Ralf; and Weimann, Gunter, 4,202,873, Cl. 424-1.000.

Stemme, Otto; Schroder, Rolf; Lermann, Peter; and Karl, Horst, to AGFA-Gevaert, A.G. Film-transport system for photographic still camera. 4,202,616, Cl. 354-173.000.

Stenudd, Sven G. V., to Facit Aktiebolag. Device for pointwise action on an information carrying medium. 4,202,638, Cl. 400-124.000.

Stephenson, Richard G.: *See—*
Isaak, Robert D.; Klund, William E.; Littrell, Woodrow H.; and Stephenson, Richard G., 4,203,164, Cl. 367-134.000.

Sterling Drug Inc.: *See—*
Lewis, Thomas R.; and Michne, William F., 4,202,983, Cl. 546-97.000.
Lewis, Thomas R.; and Michne, William F., 4,202,984, Cl. 546-97.000.

Sterling, Jeffrey: *See—*
Weiner, Ben-Zion; Sterling, Jeffrey; Suchi, Raul; and Yellin, Haim, 4,202,892, Cl. 424-244.000.

Stern, Howard K.: *See—*
Di Matteo, Paul L.; Ross, Joseph A.; Stern, Howard K.; and Waszak, Lawrence, 4,202,612, Cl. 353-28.000.

Sternglass, Ernest J.: *See—*
Gur, David; Sashin, Donald; and Sternglass, Ernest J., 4,203,037, Cl. 250-505.000.

Stevens, Roger C., to Twiflex Couplings Limited. Brake actuating mechanisms. 4,202,430, Cl. 188-171.000.

Stewart, Errol G. Aquatic weed cutter, de-rooter and harvester. 4,202,155, Cl. 56-9.000.

Stewart, Myron C.: *See—*
Coleman, Clyde F.; and Stewart, Myron C., 4,202,594, Cl. 339-147.00R.

Stillman, Neil W., to Diamond Shamrock Corporation. Electrolytic generation of halogen biocides. 4,202,738, Cl. 204-95.000.

Stolze, Lutz: *See—*
den Hartog, Huibert; Stann, Klaus; and Stolze, Lutz, 4,202,194, Cl. 72-78.000.

Stone, James D.: *See—*
Hunter, Don L.; Woods, William G.; Stone, James D.; and LeFevre, Cecil W., 4,202,839, Cl. 260-569.000.

Stoner, Glenn E.; and Cahen, George L., Jr., to Research Corporation. Apparatus and method for disinfecting objects. 4,202,740, Cl. 204-130.000.

Storey, L. Robert; and Hall, Robert C., to Cordis Dow Corp. Apparatus and method for preparation of a hemodialysis solution optionally containing bicarbonate. 4,202,760, Cl. 210-22.00A.

Strader, Don S., to Motor Wheel Corporation. Tandem axle suspension system. 4,202,564, Cl. 280-678.000.

Strand, Jerome E.: *See—*
Thill, Gary A.; and Strand, Jerome E., 4,202,333, Cl. 128-218.00A.

Straub, John D.: *See—*
Kent, Lenore S.; and Straub, John D., 4,202,604, Cl. 350-291.000.

Strickland, C. Gene. Modular pig cage assembly. 4,202,292, Cl. 119-20.000.

Striebig, Ludwig. Device for cutting building panels. 4,202,231, Cl. 83-453.000.

Strobel, Walter: *See—*
Schmidt, Helmut; Strobel, Walter; Treude, Gunter; and Blaser, Paul, 4,202,640, Cl. 400-491.200.

Strom, Torsten E. T., to AB Gustavsberg. Tube joint. 4,202,568, Cl. 285-336.000.

Stroobants, Marcel: *See—*
Van Goethem, Hugo V.; Stroobants, Marcel; and De Winter, Walter F., 4,202,697, Cl. 430-306.000.

Stul, Iosif N.: *See—*
Latash, Jury V.; Voronin, Alexei E.; Nikolaev, Vladimir A.; Pelts, Boris B.; Volokhonsky, Lev A.; Artemiev, Vladimir D.; Vlasov, Mikhail I.; Chernyak, Alexandr I.; Nikulin, Alexandr A.; Dub, Vladimir S.; Vasiliev, Yakov M.; Stul, Iosif N.; Mukha, Vitaly P.; Orlov, Gennady I.; Khasin, Kim M.; Naryshkin, Jury A.; Belsky, Valentin I; Veligura, Ilya L.; Bogdashich, Vladimir E.; Lisitsin, Vladimir A.; Mischenko, Alexandr V.; Kovalenko, Jury A.; Babin, Vladimir V.; Svitenko, Igor A.; Antonov, Vladimir I.; and Smolyarenko, Volemir D., 4,202,401, Cl. 164-252.000.

Suchi, Raul: *See—*
Weiner, Ben-Zion; Sterling, Jeffrey; Suchi, Raul; and Yellin, Haim, 4,202,892, Cl. 424-244.000.

Suddeutsche Kuhlerfabrik Julius Fr. Behr GmbH & Co. K.G.: *See—*
Nonnenmann, Manfred; Hauser, Kurt; and Schwarz, Gebhard, 4,202,296, Cl. 123-41.480.

Sugerman, Gerald: *See—*
Monte, Salvatore J.; and Sugerman, Gerald, 4,202,810, Cl. 260-31.20N.

Suggitt, Robert M.; Gilmer, William N.; and Richter, George N., to Texaco Inc. Process for producing power. 4,202,167, Cl. 60-39.020.

Suginuma, Atsushi: *See—*
Kawashima, Kenichi; Arima, Yosiaki; Endo, Yoshihide; Suginuma, Atsushi; Uenishi, Akira; and Miyamoto, Seigo, 4,202,182, Cl. 62-511.000.

Suhara, Manabu: *See—*
Oda, Yoshio; Suhara, Manabu; Goto, Shoziro; Hukushima, Takashi; Miura, Koji; and Hamano, Toshikatsu, 4,202,743, Cl. 204-98.000.

Suhara, Yasuji; Maruyama, Hiromi; Itoh, Sayuri; and Yokose, Kazuteru, to Hoffmann-La Roche Inc. Resolution of a racemate. 4,202,943, Cl. 435-280.000.

Sukkarie, Ghassan A. Method and means for fixation and immobilization of the jaws. 4,202,328, Cl. 128-89.00A.

Sullivan, Barry J. Collapsible baby enclosure. 4,202,065, Cl. 5-99.00A.

Sulzer Brothers Limited: *See—*
Bader, Hartmann, 4,202,380, Cl. 139-368.000.

Sumitomo Chemical Company, Limited: *See—*
Inaba, Shigeho; Yamamoto, Michihiro; Ishizumi, Kikuo; Mori, Kazuo; and Yamamoto, Hisao, 4,202,895, Cl. 424-250.000.
Yamamoto, Michihiro; Katayama, Shigenari; Koshiba, Masao; and Yamamoto, Hisao, 4,202,974, Cl. 544-251.000.

Sumitomo Electric Industries, Ltd.: *See—*
Hirai, Masataka; and Matsuno, Koichiro, 4,202,475, Cl. 225-2.000.
Hirai, Masataka; and Matsuno, Koichiro, 4,202,475, Cl. 225-2.000.

Sundberg-Ferar, Inc.: *See—*
Heck, Richard A.; and Dekker, David J., 4,202,395, Cl. 160-84.00R.

Sundstrand Corporation: *See—*
Linscott, Phillip S., Jr., 4,203,044, Cl. 310-61.000.

Suprun, Sergei A.: *See—*
Pokhodnya, Igor K.; Shlepakov, Valery N.; and Suprun, Sergei A., 4,203,024, Cl. 219-146.100.

Sutherland, Robert L., to Federal Paper Board Company, Inc. Bottle package. 4,202,446, Cl. 206-147.000.

Sutko, Ronald R.: *See—*
Hanas, Walter E.; and Sutko, Ronald R., 4,202,522, Cl. 249-102.000.

Suzki, Akiyoshi; Kano, Ichiro; Yoshinari, Hideki; Tozuka, Masao; Hiraga, Ryozo; Kato, Yuzo; and Ogino, Yasuo, to Canon Kabushiki Kaisha. Photoelectric detecting apparatus. 4,202,627, Cl. 356-71.000.

Suzue, Seigo: *See—*
Irikura, Tsutomu; and Suzue, Seigo, 4,202,977, Cl. 544-362.000.

Suzuki, Atsushi, to Hitachi, Ltd. Data card. 4,202,491, Cl. 235-491.000.

Suzuki, Etsuji; Kashihara, Tomio; Hashimoto, Susumu; Watanabe, Ken; and Kodama, Tsuyoshi, to Tokyo Shibaura Electric Co., Ltd. Method for automatically controlling the position of small objects. 4,203,064, Cl. 318-640.000.

Suzuki, Kiyoshi: *See—*
Suzuki, Masane; and Suzuki, Kiyoshi, 4,202,630, Cl. 356-371.000.

Suzuki, Masane; and Suzuki, Kiyoshi, to Fuji Photo Optical Co., Ltd. Method of and apparatus for recording surface irregularity of object. 4,202,630, Cl. 356-371.000.

Suzuki, Masatoshi: *See—*
Yamaguchi, Kazuo; Tanaka, Toru; Okano, Shigeaki; Enokido, Nobuo; and Suzuki, Masatoshi, 4,202,958, Cl. 526-142.000.

Svitenko, Igor A.: *See—*
Latash, Jury V.; Voronin, Alexei E.; Nikolaev, Vladimir A.; Pelts, Boris B.; Volokhonsky, Lev A.; Artemiev, Vladimir D.; Vlasov, Mikhail I.; Chernyak, Alexandr I.; Nikulin, Alexandr A.; Dub, Vladimir S.; Vasiliev, Yakov M.; Stul, Iosif N.; Mukha, Vitaly P.; Orlov, Gennady I.; Khasin, Kim M.; Naryshkin, Jury A.; Belsky, Valentin I; Veligura, Ilya L.; Bogdashich, Vladimir E.; Lisitsin, Vladimir A.; Mischenko, Alexandr V.; Kovalenko, Jury A.; Babin, Vladimir V.; Svitenko, Igor A.; Antonov, Vladimir I.; and Smolyarenko, Volemir D., 4,202,401, Cl. 164-252.000.

Swiss Aluminium Ltd.: *See—*
Bradford, Donald R.; and White, James E., 4,202,753, Cl. 204-247.000.

Switzer, Robert D. Cartridge loader. 4,202,124, Cl. 42-89.000.

SyntexLaboratories, Inc.: *See—*
Becker, Ronald K.; and Korb, Donald R., 4,202,226, Cl. 82-12.000.

Synthelabo: *See—*
Depoortere, Henri, 4,202,898, Cl. 424-250.000.

Syozi, Toshiaki: *See*—
Nakatani, Mitsuo; Kuroki, Takashi; Syozi, Toshiaki; and Horibe, Yoshiyuki, 4,203,025, Cl. 219-216.000.

Szabo, Arthur D.: *See*—
Buchanan, Lloyd W.; Eberhart, Noah E.; and Szabo, Arthur D., 4,203,045, Cl. 310-68.00C.

Szadkowski, Stanislav; Amory, Daniel; and Thomas, Jean M., to Vesuvius International Corporation. Revolving slide gate mechanism. 4,202,473, Cl. 222-598.000.

Sztuka, Mieczyslaw: *See*—
Demidowicz, Lech; and Sztuka, Mieczyslaw, 4,202,536, Cl. 266-135.000.

Tachibana, Hiromichi: *See*—
Mizutani, Tadashi; and Tachibana, Hiromichi, 4,202,718, Cl. 156-171.000.

Tainton Company, The: *See*—
Clayton, Erith T., 4,202,915, Cl. 427-47.000.

Takahashi, Eiichi: *See*—
Ueno, Saburo; Yoshikumi, Chikao; Hirose, Fumio; Omura, Yoshio; Wada, Toshihiko; Fujii, Takayoshi; and Takahashi, Eiichi, 4,202,969, Cl. 536-1.000.

Takahashi, Gensho; Miyoshi, Kazuhito; and Tanaka, Yoneharu, to Asahi Kasei Kogyo Kabushiki Kaisha. Method of removing surface tack of cured free radical polymerized resin composition using organic carbonyl compound. 4,202,696, Cl. 430-306.000.

Takahashi, Toshiyori; Ojima, Akihiro; Matsumoto, Teruo; and Kashiwakura, Koji, to Hitachi, Ltd. High density spent fuel storage rack. 4,203,038, Cl. 250-507.000.

Takamatsu, Hiroshi: *See*—
Sato, Makoto; Takamatsu, Hiroshi; Miyagawa, Yoshitaka; and Fujii, Etsuo, 4,202,584, Cl. 303-105.000.

Takamori, Kazumi: *See*—
Shibasaki, Hatsuhiko; Omura, Junishi; Tanabe, Tetsuo; and Takamori, Kazumi, 4,202,092, Cl. 29-741.000.

Takasago Perfumery Co., Ltd.: *See*—
Ogawa, Koichi; Tezuka, Shichigoro; Sato, Yoshinori; Moroe, Michio; Tsuruta, Haruki; and Yoshida, Toshio, 4,202,906, Cl. 426-3.000.

Takasue, Takashi: *See*—
Matsui, Kazumi; Takasue, Takashi; and Iwasaki, Masami, 4,202,273, Cl. 104-298.000.

Takatsu, Haruyoshi: *See*—
Sato, Hisato; Takatsu, Haruyoshi; and Tazume, Masayuki, 4,202,791, Cl. 252-299.000.

Takatsuki, Akira: *See*—
Tamura, Gakuzo; and Takatsuki, Akira, 4,202,968, Cl. 536-23.000.

Takaya, Shigeo: *See*—
Misaki, Akira; Takaya, Shigeo; Yokobayashi, Koji; and Tsuburaya, Yoichi, 4,202,940, Cl. 435-101.000.
Misaki, Akira; Takaya, Shigeo; Yokobayashi, Koji; and Tsuburaya, Yoichi, 4,202,966, Cl. 536-1.000.

Takayama, Satoru: *See*—
Yamaguchi, Nobutaka; Takayama, Satoru; and Fujiyama, Masaki, 4,202,927, Cl. 428-323.000.

Takeda Chemical Industries, Ltd.: *See*—
Marumoto, Ryuji; Furukawa, Yoshiyasu; and Kawai, Kiyohisa, 4,202,975, Cl. 544-255.000.

Takekoshi, Tohru, to General Electric Company. Method for making substantially anhydrous alkali metal bisphenol salts. 4,202,993, Cl. 568-723.000.

Takeuchi, Atsushi, to Nippon Gakki Seizo Kabushiki Kaisha. Device for manually controlling movement of pickup arm in automatic record player. 4,202,549. Cl. 274-9.0RA.

Takeuchi, Tomio: *See*—
Umezawa, Hamao; Aoyagi, Takaaki; and Takeuchi, Tomio, 4,202,824, Cl. 260-343.900.

Takimoto, Ichizo: *See*—
Osada, Kazuhiko; Ogawa, Yoshishige; and Takimoto, Ichizo, 4,203,103, Cl. 340-753.000.

Talbot, Tully W.; Barrows, George T.; and Thompson, Granville B., to Redel, Inc. Livestock feed supplement. 4,202,887, Cl. 424-154.000.

Tamura, Gakuzo; and Takatsuki, Akira, to Meiji Seika Kaisha, Ltd. New tunicamine derivatives and their preparation. 4,202,968, Cl. 536-23.000.

Tamura, Tetsuomi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Automatic choke arrangement. 4,202,302, Cl. 123-119.00F.

Tanabe, Tetsuo: *See*—
Shibasaki, Hatsuhiko; Omura, Junishi; Tanabe, Tetsuo; and Takamori, Kazumi, 4,202,092, Cl. 29-741.000.

Tanaka, Hiromitsu: *See*—
Asano, Kiro; Saito, Tsuyoshi; Tanaka, Hiromitsu; and Enomoto, Satoru, 4,202,885, Cl. 424-95.000.

Tanaka, Toru: *See*—
Yamaguchi, Kazuo; Tanaka, Toru; Okano, Shigeaki; Enokido, Nobuo; and Suzuki, Masatoshi, 4,202,958, Cl. 526-142.000.

Tanaka, Yoneharu: *See*—
Takahashi, Gensho; Miyoshi, Kazuhito; and Tanaka, Yoneharu, 4,202,696, Cl. 430-306.000.

Tansi, Hakki M., to Eagle Electric Mgf. Co., Inc. Foldable electrical outlet box. 4,202,457, Cl. 220-3.300.

Tasch, Al F., Jr.: *See*—
Chatterjee, Pallab K.; Taylor, Geoff W.; Tasch, Al F., Jr.; and Fu, Horng-Sen, 4,203,125, Cl. 357-41.000.

Tateishi, Tetsuya, to Agency of Industrial Science & Technology, Ministry of International Trade & Industry. Method for preventing sedimentation of finely powdered coal in colloidal fuel. 4,202,670, Cl. 44-51.000.

Tattermusch, Peter, to Daimler-Benz Aktiengesellschaft. Independent wheel suspension for motor vehicles, especially for passenger motor vehicles. 4,202,563, Cl. 280-675.000.

Tattersall, Graham D., to Post Office, The. Unbalanced/balanced converter circuits. 4,203,009, Cl. 179-16.0AA.

Taya, Miguel M.; Aedo, Dionisio M.; and Ricard, Rene, to Rogador Sociedad Anonima. Quercetin pentamethyl carbamate and a process for its preparation. 4,202,825, Cl. 260-345.200.

Taylor, Andrew W.; Burton, George; and Clayton, John P., to Beecham Group Limited. Ketenimine cephalosporins. 4,202,973, Cl. 544-21.000.

Taylor, Geoff W.: *See*—
Chatterjee, Pallab K.; Taylor, Geoff W.; Tasch, Al F., Jr.; and Fu, Horng-Sen, 4,203,125, Cl. 357-41.000.

Taylor, James D., to BASF Wyandotte Corporation. Thixotropic isocyanate-terminated prepolymers and use in the preparation of polyurethane coating compositions. 4,202,956, Cl. 528-75.000.

Taylor, Lloyd D., to Polaroid Corporation. Pendant oxime polymers and photographic use thereof. 4,202,694, Cl. 430-215.000.

Tazume, Masayuki: *See*—
Sato, Hisato; Takatsu, Haruyoshi; and Tazume, Masayuki, 4,202,791, Cl. 252-299.000.

Team, Inc.: *See*—
Harrison, George W., 4,202,377, Cl. 138-94.000.

Technical Wire Products: *See*—
Dalamangas, Chris A.; Piccirillo, Thomas P.; and Seip, Donald P., 4,202,588, Cl. 339-59.00M.

Technofast, Inc.: *See*—
Gutshall, Charles E., 4,202,244, Cl. 85-45.000.

Tegge, Bruce R., Jr., to Motorola, Inc. Package and method of packaging semiconductor wafers. 4,203,127, Cl. 357-55.000.

Teledyne Industries, Inc.: *See*—
Jacoby, Lawrence J.; Rosenau, Richard A.; Carter, Dorothy P.; Nielsen, Ralph H.; and Ash, Kenneth C., 4,202,862, Cl. 423-70.000.

Teledyne McCormick Selph: *See*—
Goddard, Terrence P., 4,202,712, Cl. 149-22.000.

Temple, Robert S. Jet type heat exchanger. 4,202,408, Cl. 165-109.000.

Tenneco Chemicals, Inc.: *See*—
Di Bella, Eugene P., 4,202,843, Cl. 260-985.000.
Di Bella, Eugene P., 4,202,844, Cl. 260-985.000.

Ten Pas, Gary C. Spray gun. 4,202,497, Cl. 239-112.000.

Teodorescu, Constantin; Ceauselu, Constantin; and Ardeleanu, Stefan, to Institutul National Pentru Creatie Stiintifica Si Tehnica. Pneumatic transport apparatus and method of propulsion. 4,202,272, Cl. 104-91.000.

Terada, Osamu; Uwajima, Takayuki; Mihara, Akira; Aisaka, Kazuo; Akita, Hiroko; Nagai, Toshiaki; and Shimizu, Yoshiaki, to Kyowa Hakko Kogyo, Co. Ltd. Glycerol oxidase and process for the production thereof and method for the quantitative determination of glycerol by glycerol oxidase. 4,202,941, Cl. 435-190.000.

Teramura, Satoshi: *See*—
Washizuka, Isamu; Teramura, Satoshi; and Matsuishi, Masanori, 4,202,607, Cl. 350-338.000.

Terashima, Akira: *See*—
Namiki, Yasushi; Terashima, Akira; and Yoshizawa, Naomi, 4,202,235, Cl. 84-1.010.

Tersteegen, Bernd; and Van Endert, Gunter. Double lumen catheter. 4,202,332, Cl. 128-214.400.

Teshima, Soichi: *See*—
Murakami, Fumiki; Teshima, Soichi; and Yokoyama, Toshihiko, 4,202,990, Cl. 560-217.000.

Tessier, Jean: *See*—
Prost-Marechal, Jacques; and Tessier, Jean, 4,202,835, Cl. 260-465.00F.

Teva Pharmaceutical Industries, Ltd.: *See*—
Weiner, Ben-Zion; Sterling, Jeffrey; Suchi, Raul; and Yellin, Haim, 4,202,892, Cl. 424-244.000.

Texaco Inc.: *See*—
Johnson, Jay P.; Parrack, Alvin L.; and Lunsford, Delbert R., 4,203,161, Cl. 367-40.000.
Suggitt, Robert M.; Gilmer, William N.; and Richter, George N., 4,202,167, Cl. 60-39.020.

Texas Instruments Incorporated: *See*—
Chatterjee, Pallab K.; Taylor, Geoff W.; Tasch, Al F., Jr.; and Fu, Horng-Sen, 4,203,125, Cl. 357-41.000.
Edwards, Jon L., 4,203,093, Cl. 340-365.00L.

Texasgulf Inc.: *See*—
Conroy, Edward H.; Gloster, Arthur; and King, James A., 4,202,667, Cl. 23-302.00T.

Tezuka, Shichigoro: *See*—
Ogawa, Koichi; Tezuka, Shichigoro; Sato, Yoshinori; Moroe, Michio; Tsuruta, Haruki; and Yoshida, Toshio, 4,202,906, Cl. 426-3.000.

Thatcher, Gordon: *See*—
Duncombe, Edward; and Thatcher, Gordon, 4,202,726, Cl. 176-18.000.

Thermo Electron Corporation: *See*—
Lazaridis, Lazaros J.; Miskolczy, Gabor; and Shefsiek, Paul K., 4,202,661, Cl. 432-8.000.

Thill, Gary A.; and Strand, Jerome E., to Minnesota Mining and Manufacturing Company. Fluid dispensing device. 4,202,333, Cl. 128-218.00A.

Thoese, Klaus, to Hoechst Aktiengesellschaft. Drawing layer for plastic films. 4,202,923, Cl. 428-144.000.

Thomas Broadbent & Sons Limited: *See*—
Jackson, Joseph F.; and Cooper, Edward M., 4,202,488, Cl. 233-24.000.

Thomas Industries of Tennessee Inc.: *See*—
Hamrick, James C., 4,202,531, Cl. 254-134.400.

Thomas, Jean M.: *See*—
Szadkowski, Stanislav; Amory, Daniel; and Thomas, Jean M., 4,202,473, Cl. 222-598.000.

Thompson Bagel Machine Manufacturing Corp.: *See*—
Thompson, Daniel T., 4,202,221, Cl. 74-821.000.

Thompson, Daniel T., to Thompson Bagel Machine Manufacturing Corp. Indexing apparatus. 4,202,221, Cl. 74-821.000.

Thompson, George H. B.; and Lovelace, David F., to ITT Industries, Inc. Injection lasers. 4,203,079, Cl. 331-94.50H.

Thompson, Granville B.: *See*—
Talbot, Tully W.; Barrows, George T.; and Thompson, Granville B., 4,202,887, Cl. 424-154.000.

Thompson, John W.: *See*—
Zannucci, Joseph S.; and Thompson, John W., 4,202,788, Cl. 252-182.000.

Thompson, Thomas K., to Owens-Corning Fiberglas Corporation. Fluid flow apparatus in combination with glass fiber forming apparatus. 4,202,680, Cl. 65-12.000.

Thomson-Brandt: *See*—
Bricot, Claude; and Lehureau, Jean-Claude, 4,203,133, Cl. 358-128.500.

Three Rivers Aluminum Company: *See*—
Randall, Robert P., 4,202,137, Cl. 49-458.000.

Three Sisters Ranch Enterprises: *See*—
Faulstich, George W., 4,202,455, Cl. 215-31.000.

Thumm, Helmut, to Sauter Feinmechanik GmbH. Multiple position tool holder. 4,202,227, Cl. 82-36.00A.

Thuringer, Frieda P. Craft board. 4,202,569, Cl. 289-18.100.

Thwaites, Peter John, to Dufaylite Developments Limited. Structural cellular materials. 4,202,253, Cl. 93-1.00H.

Thyssen Industrie Aktiengesellshaft: *See*—
Bitterberg, Friedhelm, 4,202,275, Cl. 105-61.000.

TIE/Communications, Inc.: *See*—
Coviello, Frank A., 4,203,011, Cl. 179-99.00M.

Tiefels, Wilhelm: *See*—
Jaeger, Erwin; and Tiefels, Wilhelm, 4,202,448, Cl. 206-392.000.

TII Corporation (Telecommunications Industries, Inc.): *See*—
Armstrong, Edward T., 4,202,371, Cl. 137-604.000.

Tilley, Jefferson W.: *See*—
Fahrenholtz, Kenneth E.; Guthrie, Robert W.; Kierstead, Richard W.; and Tilley, Jefferson W., 4,202,978, Cl. 544-393.000.

Timberline, Inc.: *See*—
Wilkes, Ted W., Jr.; and Wentworth, Darel L., 4,202,453, Cl. 212-55.000.

Tipe Revent AB: *See*—
Johansson, Leif A. T., 4,202,259, Cl. 99-352.000.

Tipsword, Wilbur M. Automatically signaling mailbox. 4,202,486, Cl. 232-35.000.

Titow, Victor W.: *See*—
Clifton, John D.; and Titow, Victor W., 4,202,359, Cl. 132-5.000.

Toepsch, Hans: *See*—
de Montigny, Armand; Toepsch, Hans; and Buchner, Werner, 4,202,929, Cl. 428-452.000.

Togasi, Mituyuki: *See*—
Hukuzawa, Soiti; Togasi, Mituyuki; and Mori, Toshiro, 4,202,187, Cl. 68-18.00F.

Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Fukuda, Takeo; and Murayama, Hideaki, 4,203,005, Cl. 179-1.0CN.

Tokyo Shibaura Electric Co., Ltd.: *See*—
Katakura, Masayuki, 4,203,043, Cl. 307-254.000.
Osada, Kazuhiko; Ogawa, Yoshishige; and Takimoto, Ichizo, 4,203,103, Cl. 340-753.000.
Seki, Nagataka, 4,203,047, Cl. 307-252.00C.
Suzuki, Etsuji; Kashihara, Tomio; Hashimoto, Susumu; Watanabe, Ken; and Kodama, Tsuyoshi, 4,203,064, Cl. 318-640.000.

Tolle, Gunther: *See*—
Nixdorf, Hans W.; and Tolle, Gunther, 4,202,069, Cl. 15-250.030.

Tolley, William K., to UOP Inc. Separation of iron metal values from titanium metal values. 4,202,863, Cl. 423-82.000.

Tolstoguzov, Vladimir B.: *See*—
Nesmeyanov, Alexandr N.; Rogozhin, Sergei V.; Tolstoguzov, Vladimir B.; Misjurev, Vladimir I.; Ershova, Vera A.; and Braudo, Evgeny E., 4,202,908, Cl. 426-72.000.

Tomashek, James R.: *See*—
Sheldon, Loren B.; Tomashek, James R.; and Ward, Donald H., 4,202,225, Cl. 81-57.350.

Tomura, Yoshihiro, to Pilot Man-Nen-Hitsu Kabushiki Kaisha. Multiple-point writing instrument including a mechanical pencil unit. 4,202,641, Cl. 401-32.000.

Tomy Kogyo Co., Inc.: *See*—
Watanabe, Hiroyuki, 4,202,545, Cl. 273-87.00R.

Tong, George L.; Henry, David W.; Wu, Helen Y.; and Smith, Thomas H., to SRI International. N,N-pentamethylene derivatives of daunomycin and adriamycin. 4,202,967, Cl. 536-17.00A.

Torgersen, Gerard J.: *See*—
Oktay, Sevgin; Torgersen, Gerard J.; and Wong, Alexander C., 4,203,129, Cl. 357-82.000.

Toriselli, Franco, to S.I.C.E. Societa Italiana Costruzioni Elettromeccaniche S.p.A. Device for automatically locking motor vehicle wheels on to balancing machines. 4,202,213, Cl. 73-487.000.

Torres, Ismael. Multi-angular radiant energy modulator. 4,202,602, Cl. 350-272.000.

Tosswill, Christopher H., to Galileo Electro-Optics Corporation. Non-uniform imaging. 4,202,599, Cl. 350-96.250.

Toth, Robert L.: *See*—
Mineur, Mark H.; and Toth, Robert L., 4,202,392, Cl. 152-330.00L.

Totsu, Katsuyuki. Control means for the wire wrapping machine. 4,203,057, Cl. 318-285.000.

Touze, Pierre. Openable bath. 4,202,060, Cl. 4-173.00R.

Towsend, Marvin S. Electric power interrupting apparatus. 4,203,101, Cl. 340-635.000.

Toyo Kogyo Co., Ltd.: *See*—
Moriyoshi, Hiroshi, 4,202,311, Cl. 123-195.00C.
Nishikoori, Tsutomu, 4,202,571, Cl. 292-216.000.

Toyo Rubber Industry Co., Ltd., The: *See*—
Shibayama, Toshiyuki; and Nakakura, Kenji, 4,202,391, Cl. 152-209.00D.

Toyoda, Takeharu: *See*—
Shimada, Noburo; Miyamoto, Akira; Kobayashi, Motonobu; Kuribayashi, Akio; Toyoda, Takeharu; Kimura, Morihiro; Kyoden, Hiroshi; Hoshino, Toshisuke; and Watanabe, Jiro, 4,202,538, Cl. 266-275.000.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Kondo, Toshio; Harada, Susumu; Ito, Nobuyuki; and Kobayashi, Nobuyuki, 4,202,295, Cl. 123-32.0EH.
Mori, Kouichi; Igashira, Toshihiko; and Yamaguchi, Shunzo, 4,202,312, Cl. 123-210.000.
Tamura, Tetsuomi, 4,202,302, Cl. 123-119.00F.
Wakita, Nobuaki; and Igarashi, Kohei, 4,202,173, Cl. 60-290.000.

Tozuka, Masao: *See*—
Suzki, Akiyoshi; Kano, Ichiro; Yoshinari, Hideki; Tozuka, Masao; Hiraga, Ryozo; Kato, Yuzo; and Ogino, Yasuo, 4,202,627, Cl. 356-71.000.

Tracor, Inc.: *See*—
Hall, Randall C.; and Ehrlich, Burney J., 4,202,666, Cl. 23-232.00E.

Tradgardshallen i Helsingborg Planteringsvagen: *See*—
Wadenhed, Gustav, 4,202,278, Cl. 108-102.000.

Transver AG: *See*—
Buhrer, Werner, 4,202,443, Cl. 198-831.000.

Trantorque Corporation: *See*—
Soussloff, Dimitri G., 4,202,644, Cl. 403-369.000.

Trenkle, Robert W.; Mookherjee, Braja D.; Kasper, Robin L.; and Vock, Manfred H., to International Flavors & Fragrances Inc. Substituted 1-oxyalkyl-2,6,6-trimethyl-cyclohexene derivatives, organoleptic uses thereof, syntheses for preparing same and intermediates used in said syntheses. 4,202,994, Cl. 568-824.000.

Treude, Gunter: *See*—
Schmidt, Helmut; Strobel, Walter; Treude, Gunter; and Blaser, Paul, 4,202,640, Cl. 400-491.200.

Tri-Tronics, Inc.: *See*—
Gonda, Gerald J.; and Vancza, John, Jr., 4,202,293, Cl. 119-29.000.

Trias, John A.: *See*—
Hammond, Peter R.; Henry, Ronald A.; Trias, John A.; and Schimitischek, Erhard J., 4,202,981, Cl. 546-82.000.

Trio Kabushiki Kaisha: *See*—
Morinaga, Mitsuyoshi, 4,202,550, Cl. 274-23.00R.

Tschunt, Edgar, to Siemens Aktiengesellschaft. X-ray diagnostic apparatus for producing transverse layer images. 4,203,036, Cl. 250-445.00T.

Tseng, Chien K.: *See*—
Gray, Reed A.; Tseng, Chien K.; and Rusay, Ronald J., 4,202,840, Cl. 260-438.100.

Tsuburaya, Yoichi: *See*—
Misaki, Akira; Takaya, Shigeo; Yokobayashi, Koji; and Tsuburaya, Yoichi, 4,202,940, Cl. 435-101.000.
Misaki, Akira; Takaya, Shigeo; Yokobayashi, Koji; and Tsuburaya, Yoichi, 4,202,966, Cl. 536-1.000.

Tsukamoto, Keiji: *See*—
Komiyama, Katsuhiko; Kasama, Noriyuki; Tsukamoto, Keiji; and Murakami, Tomomi, 4,202,166, Cl. 368-82.000.

Tsukamoto, Masahide; Nagasawa, Masahiro; and Yamazoe, Hiroshi, to Matsushita Electric Industrial Co., Ltd. Surface acoustic wave filter. 4,203,082, Cl. 333-194.000.

Tsuruoka, Takashi: *See*—
Ohba, Kazunori; Shomura, Takashi; Ogawa, Yasuaki; Tsuruoka, Takashi; Watanabe, Hiroshi; Hisamatsu, Takashi; Uchida, Shingo; Kojima, Michio; and Inouye, Shigeharu, 4,202,886, Cl. 424-122.000.

Tsuruta, Haruki: *See*—
Ogawa, Koichi; Tezuka, Shichigoro; Sato, Yoshinori; Moroe, Michio; Tsuruta, Haruki; and Yoshida, Toshio, 4,202,906, Cl. 426-3.000.

Tsuyama, Yasuharu: *See*—
Oku, Yuji; and Tsuyama, Yasuharu, 4,202,297, Cl. 123-65.0PE.

Tuccio, Sam A.: *See*—
Hartford, Allen, Jr.; and Tuccio, Sam A., 4,202,741, Cl. 204-158.00R.

Tuchman, Walter L.: *See*—
Ehrsam, William F.; Elander, Robert C.; Matyas, Stephen M.; Meyer, Carl H. W.; Sahulka, Richard J.; and Tuchman, Walter L., 4,203,166, Cl. 375-2.000.

Tuchscherer, Lawrence D., to General Motors Corporation. Roller bank sensor contact system. 4,203,015, Cl. 200-61.45R.

Tummolo, Mauro, to Tummolo, Mauro. Method and machine for dry character transfer. 4,202,637, Cl. 400-118.000.
Tunick, Allen A.: *See—*
Koff, Fred W.; Tunick, Allen A.; Sifniades, Stylianos; and Belden, Reed H., 4,202,765, Cl. 210-31.00R.
Turk, Herbert; Schiminski, Herbert; and Lenk, Erich, to Barmag Barmer Maschinenfabrik Aktiengesellschaft. Spinning process and apparatus. 4,202,163, Cl. 57-58.950.
Tuscarora Yarns, Inc.: *See—*
Foil, Martin B., Jr., 4,202,161, Cl. 57-12.000.
Tuschy, Eckhard; Wischmeyer, Georg; and Steinkamp, Walter, to Kabel-und Metallwerke Gutehoffnungshuette AG. Skew rolling mill roller. 4,202,195, Cl. 72-78.000.
Twiflex Couplings Limited: *See—*
Stevens, Roger C., 4,202,430, Cl. 188-171.000.
Twinpak Ltd.: *See—*
Howell, Bryan G.; and Ringrose, Gordon H., 4,202,450, Cl. 206-459.000.
Twyford, Robert H., to Mechanical Enterprises, Incorporated. Electric switch utilizing coil spring torsion biasing in switch operation. 4,203,016, Cl. 200-159.00R.
Tzikas, Athanassios, to Ciba-Geigy Corporation. Process for the production of 1-anthraquinonyl hydrazine. 4,202,827, Cl. 260-378.000.
U.T.I.-Spectrotherm Corporation: *See—*
Holzl, Robert A.; Pickett, Frederick P.; and Lawrence, James L., Jr., 4,202,080, Cl. 29-25.180.
Ube Industries, Ltd.: *See—*
Yamamoto, Shinji; Kaijiri, Kouhei; and Oda, Denichi, 4,202,850, Cl. 264-108.000.
Uchida, Shingo: *See—*
Ohba, Kazunori; Shomura, Takashi; Ogawa, Yasuaki; Tsuruoka, Takashi; Watanabe, Hiroshi; Hisamatsu, Takashi; Uchida, Shingo; Kojima, Michio; and Inouye, Shigeharu, 4,202,886, Cl. 424-122.000.
Uchiyama, Yasushi; and Awamura, Daikichi, to Nippon Jidoseigyo Ltd. Apparatus for detecting defects in patterns. 4,202,631, Cl. 356-394.000.
Udelhofen, John H.: *See—*
Cahill, Paul J.; and Udelhofen, John H., 4,202,784, Cl. 252-51.50R.
Uehara, Itsuki: *See—*
Ishii, Eiichi; Nakane, Masanori; Ishikawa, Hiroshi; Uehara, Itsuki; and Miyake, Yoshizo, 4,202,917, Cl. 427-161.000.
Uenishi, Akira: *See—*
Kawashima, Kenichi; Arima, Yosiaki; Endo, Yoshihide; Suginuma, Atsushi; Uenishi, Akira; and Miyamoto, Seigo, 4,202,182, Cl. 62-511.000.
Ueno, Saburo; Yoshikumi, Chikao; Hirose, Fumio; Omura, Yoshio; Wada, Toshihiko; Fujii, Takayoshi; and Takahashi, Eiichi, to Kureha Kagaku Kogyo Kabushiki Kaisha. Method of producing nitrogen-containing polysaccharides. 4,202,969, Cl. 536-1.000.
Ujita, Katsu: *See—*
Imataki, Mitsumasa; Ujita, Katsu; and Egashira, Tsutomu, 4,203,143, Cl. 361-120.000.
Ulrich, Henri: *See—*
Smith, Curtis P.; and Ulrich, Henri, 4,202,779, Cl. 252-8.100.
Smith, Curtis P.; and Ulrich, Henri, 4,202,946, Cl. 521-169.000.
Ultraflux: *See—*
Multon, Francois; and Allain, Gerard, 4,202,210, Cl. 73-194.00A.
Umetsu, Junji: *See—*
Urano, Fumio; Arai, Akihiro; Kobayashi, Takumi; and Umetsu, Junji, 4,202,617, Cl. 354-268.000.
Umezawa, Hamao; Aoyagi, Takaaki; and Takeuchi, Tomio, to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai. Physiologically active derivatives of esterastin. 4,202,824, Cl. 260-343.900.
Uni-Cardan Aktiengesellschaft: *See—*
Krude, Werner; and Jordan, Alfons, 4,202,184, Cl. 64-32.00R.
Union Carbide Corporation: *See—*
Fan, You-Ling, 4,202,808, Cl. 260-29.6WB.
Weber, Willis W.; Caglione, Alexander J.; Frost, Albert C.; and Weeks, Thomas J., Jr., 4,202,870, Cl. 423-630.000.
Uniroyal Aktiengesellschaft: *See—*
van der Burg, Sjirk, 4,202,394, Cl. 152-361.00R.
Uniroyal, Inc.: *See—*
Peascoe, Warren J., 4,202,948, Cl. 525-70.000.
Petersen, Henno A., 4,202,801, Cl. 260-5.000.
von Schmeling, Bogislav; and Boos, Walter R., 4,202,904, Cl. 424-330.000.
Uniroyal Ltd.: *See—*
von Schmeling, Bogislav; and Boos, Walter R., 4,202,904, Cl. 424-330.000.
United Kingdom Atomic Energy Authority: *See—*
Duncombe, Edward; and Thatcher, Gordon, 4,202,726, Cl. 176-18.000.
United States Borax & Chemical Corporation: *See—*
Hunter, Don L.; Woods, William G.; Stone, James D.; and Le-Fevre, Cecil W., 4,202,839, Cl. 260-569.000.
United States of America
Air Force: *See—*
Benser, Earl H., 4,202,516, Cl. 244-3.150.
Viravec, Joseph T.; and Hoyt, Maurice A., 4,202,369, Cl. 137-508.000.
Army: *See—*
Alley, Bernard J.; Dake, James D.; and Dykes, Hiram W. H., 4,202,714, Cl. 149-109.400.
Day, John H., 4,202,271, Cl. 102-247.000.
Hannigan, Joseph F., 4,203,115, Cl. 343-112.00R.
Jacobs, Harold; and Horn, Robert E., 4,203,117, Cl. 343-701.000.
Maxwell, Richard F., Jr., 4,202,515, Cl. 244-3.110.
Merritt, James A., 4,202,104, Cl. 331-94.50G.
Messineo, Joseph R.; and Lehwald, George F., 4,202,269, Cl. 102-8.000.
Energy: *See—*
Brehm, William F.; and McGuire, Joseph C., 4,202,730, Cl. 176-37.000.
Csakvary, Tibor; and Fromson, Robert E., 4,202,739, Cl. 204-129.350.
Newkirk, Lawrence R.; and Valencia, Flavio A., 4,202,931, Cl. 428-662.000.
Rand, Peter B., 4,202,279, Cl. 109-34.000.
Wilder, James A., Jr., 4,202,700, Cl. 106-39.600.
Health, Education and Welfare: *See—*
Gale, Glen R.; and Schwartz, Paul, 4,202,890, Cl. 424-200.000.
Navy: *See—*
Clearwaters, Walter L.; Einstein, Lloyd T.; Radics, Paul F., Jr.; and Soderberg, John W., 4,203,162, Cl. 367-122.000.
Dick, John O., 4,203,110, Cl. 343-7.0PF.
Doherty, John J., 4,203,160, Cl. 367-2.000.
Hammond, Peter R.; Henry, Ronald A.; Trias, John A.; and Schimitischek, Erhard J., 4,202,981, Cl. 546-82.000.
Hillery, Herbert V., 4,203,165, Cl. 367-135.000.
Isaak, Robert D.; Klund, William E.; Littrell, Woodrow H.; and Stephenson, Richard G., 4,203,164, Cl. 367-134.000.
Key, Carroll L., Jr., 4,203,163, Cl. 367-125.000.
Sippel, Nathan J.; Hiser, Earl J.; and Christy, John, 4,202,668, Cl. 44-7.00A.
Young, Robert W.; and Dansbury, Leonard D., 4,202,517, Cl. 244-3.220.
U.S. Philips Corporation: *See—*
Kuus, Gijsbert, 4,203,049, Cl. 313-174.000.
Le Can, Claude J. P. F.; and van den Beemt, Johannes A. C., 4,203,042, Cl. 307-241.000.
United States Steel Corporation: *See—*
Wiesboeck, Robert A., 4,202,283, Cl. 111-6.000.
United States Surgical Corporation: *See—*
Hirsch, Leon C.; Rawson, Paul O.; and Nagy, Louis E., 4,202,353, Cl. 128-724.000.
United Technologies Corporation: *See—*
Jalan, Vinod M., 4,202,934, Cl. 429-40.000.
Preston, John L., Jr., 4,202,865, Cl. 423-244.000.
Reiser, Carl A.; and Landau, Michael B., 4,202,933, Cl. 429-13.000.
University of Florida Board of Regents: *See—*
Carroll, Edward E., Jr., 4,203,034, Cl. 250-280.000.
University of Kentucky Research Foundation: *See—*
Digenis, George A.; and Shambhu, Manvendra B., 4,202,356, Cl. 131-10.900.
University of Pittsburgh: *See—*
Gur, David; Sashin, Donald; and Sternglass, Ernest J., 4,203,037, Cl. 250-505.000.
UOP Inc.: *See—*
Hilfman, Lee, 4,202,996, Cl. 585-377.000.
Loos, John F.; and Petty, James C., 4,202,520, Cl. 248-68.0CB.
O'Hara, Mark J.; Johnson, Russell W.; and Hilfman, Lee, 4,202,758, Cl. 208-143.000.
Tolley, William K., 4,202,863, Cl. 423-82.000.
Upjohn Company, The: *See—*
Ayer, Donald E., 4,202,970, Cl. 542-426.000.
Bonk, Henry W.; and Shah, Tilak M., 4,202,957, Cl. 528-77.000.
Dai, Sheng-Hong A., 4,202,833, Cl. 260-463.000.
Johnson, Roy A., 4,202,972, Cl. 542-426.000.
Kelly, Robert C., 4,202,971, Cl. 542-426.000.
Smith, Curtis P.; and Ulrich, Henri, 4,202,779, Cl. 252-8.100.
Smith, Curtis P.; and Ulrich, Henri, 4,202,946, Cl. 521-169.000.
Upton, Douglas J. Fluid dispensing control system. 4,202,387, Cl. 141-360.000.
Urano, Fumio; Arai, Akihiro; Kobayashi, Takumi; and Umetsu, Junji, to Asahi Kogaku Kogyo Kabushiki Kaisha. Shutter release security device in motor drive camera. 4,202,617, Cl. 354-268.000.
USM Corporation: *See—*
Hanson, Raymond, 4,202,066, Cl. 12-142.00R.
Sillars, Frederick S., 4,202,483, Cl. 228-43.000.
Usmar, Ronald A.: *See—*
Bull, Reginald B.; Duffill, Colin; and Usmar, Ronald A., 4,202,216, Cl. 73-639.000.
Usui, Kenji: *See—*
Matsuura, Ryo; Komatsu, Tatsuyoshi; Nomiyama, Yukio; and Usui, Kenji, 4,202,828, Cl. 260-396.00R.
Utsch, Francis V.: *See—*
de la Burde, Roger Z.; Aument, Patrick E.; and Utsch, Francis V., 4,202,357, Cl. 131-140.00R.
Utz, Diether: *See—*
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Terada, Osamu; Uwajima, Takayuki; Mihara, Akira; Aisaka, Kazuo; Akita, Hiroko; Nagai, Toshiaki; and Shimizu, Yoshiaki, 4,202,941, Cl. 435-190.000.
Vachhani, Vasantrai A.: *See—*
Reavis, Robert P., Jr.; Soderstrom, Melvin A.; Vachhani, Vasantrai A.; and Hughes, Richard L., 4,202,589, Cl. 339-97.00R.

Valencia, Flavio A.: *See*—
Newkirk, Lawrence R.; and Valencia, Flavio A., 4,202,931, Cl. 428-662.000.

Valmet Oy: *See*—
Kankaanpaa, Matti, 4,202,113, Cl. 34-23.000.
Kirjavainen, Alvi, 4,202,724, Cl. 162-272.000.

Vancza, John, Jr.: *See*—
Gonda, Gerald J.; and Vancza, John, Jr., 4,202,293, Cl. 119-29.000.

van den Beemt, Johannes A. C.: *See*—
Le Can, Claude J. P. F.; and van den Beemt, Johannes A. C., 4,203,042, Cl. 307-241.000.

van der Burg, Sjirk, to Uniroyal Aktiengesellschaft. Recapped pneumatic tire. 4,202,394, Cl. 152-361.00R.

VanderKelen, James B.; and Dilworth, James L., to Snow Machines, Inc. Snow making system. 4,202,496, Cl. 239-14.000.

van der Lely, Cornelis. Crop working machine. 4,202,160, Cl. 56-366.000.

Vanderveen, John W., to Phillips Petroleum Company. Mixing device with internal recycle. 4,202,636, Cl. 366-319.000.

Van Endert, Gunter: *See*—
Tersteegen, Bernd; and Van Endert, Gunter, 4,202,332, Cl. 128-214.400.

Van Fossen, Harvey G., to Wheelabrator-Frye Inc. Abrasive particle blast apparatus for surface treatment. 4,202,142, Cl. 51-425.000.

Van Gerpen, Gary W. Muscle manipulating apparatus. 4,202,326, Cl. 128-33.000.

van Gerven, Hans, to Erbe Elektromedizin KG. Cauterizing probes for cryosurgery. 4,202,336, Cl. 128-303.100.

Van Goethem, Hugo V.; Stroobants, Marcel; and De Winter, Walter F., to AGFA-GEVAERT N.V. Production of etch-resist colloid and material suitable therefor. 4,202,697, Cl. 430-306.000.

Vanham, Ernest E.: *See*—
Ballard, Samuel S.; and Vanham, Ernest E., 4,203,109, Cl. 340-850.000.

VanLoon, Paul G. G.: *See*—
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Van Vooren, Gerard: *See*—
Ragon, Philippe R.; and Van Vooren, Gerard, 4,202,713, Cl. 149-100.000.

Vasiliev, Yakov M.: *See*—
Latash, Jury V.; Voronin, Alexei E.; Nikolaev, Vladimir A.; Pelts, Boris B.; Volokhonsky, Lev A.; Artemiev, Vladimir D.; Vlasov, Mikhail I.; Chernyak, Alexandr I.; Nikulin, Alexandr A.; Dub, Vladimir S.; Vasiliev, Yakov M.; Stul, Iosif N.; Mukha, Vitaly P.; Orlov, Gennady I.; Khasin, Kim M.; Naryshkin, Jury A.; Belsky, Valentin I; Veligura, Ilya L.; Bogdashich, Vladimir E.; Lisitsin, Vladimir A.; Mischenko, Alexandr V.; Kovalenko, Jury A.; Babin, Vladimir V.; Svitenko, Igor A.; Antonov, Vladimir I.; and Smolyarenko, Volemir D., 4,202,401, Cl. 164-252.000.

Veligura, Ilya L.: *See*—
Latash, Jury V.; Voronin, Alexei E.; Nikolaev, Vladimir A.; Pelts, Boris B.; Volokhonsky, Lev A.; Artemiev, Vladimir D.; Vlasov, Mikhail I.; Chernyak, Alexandr I.; Nikulin, Alexandr A.; Dub, Vladimir S.; Vasiliev, Yakov M.; Stul, Iosif N.; Mukha, Vitaly P.; Orlov, Gennady I.; Khasin, Kim M.; Naryshkin, Jury A.; Belsky, Valentin I; Veligura, Ilya L.; Bogdashich, Vladimir E.; Lisitsin, Vladimir A.; Mischenko, Alexandr V.; Kovalenko, Jury A.; Babin, Vladimir V.; Svitenko, Igor A.; Antonov, Vladimir I.; and Smolyarenko, Volemir D., 4,202,401, Cl. 164-252.000.

Vertenstein, Mathieu J.: *See*—
Price, Frank B.; and Vertenstein, Mathieu J., 4,202,527, Cl. 251-58.000.

Vesuvius International Corporation: *See*—
Szadkowski, Stanislav; Amory, Daniel; and Thomas, Jean M., 4,202,473, Cl. 222-598.000.

Vetter, Manfred. Sealing arrangement. 4,202,379, Cl. 138-99.000.

Vickers Limited: *See*—
Kitteridge, John M.; and Armstrong, Robert J., 4,202,699, Cl. 430-302.000.

Victor Company of Japan, Limited: *See*—
Matsumoto, Sigeru, 4,202,220, Cl. 74-471.00R.

Viertel, Lothar; Mahler, Gert; and Nowak, Manfred, to Gebr. Happich GmbH. Sun visor for vehicles. 4,203,149, Cl. 362-144.000.

Vignon, Louis, to Heberlein Hispano SA. Process and apparatus for spinning textile fibres. 4,202,162, Cl. 57-58.890.

Vijugov, Oleg N.: *See*—
Batjukov, Vladimir I.; Vijugov, Oleg N.; Fadeev, Alexandr I.; Shapkin, Alexandr F.; and Dyatlov, Lev E., 4,202,727, Cl. 176-30.000.

Vilenski, Dan: *See*—
Sade, Moshe E.; Soffa, Albert; Vilenski, Dan; and Wing, William, 4,202,482, Cl. 228-4.500.

Viljanmaa, Antti K. Apparatus for hide stretching. 4,202,190, Cl. 69-19.300.

Villari, Frank K.; Ellmann, Norbert W.; and Annis, Larry D., to Kendall Company, The. Compression device with improved fastening sleeve. 4,202,325, Cl. 128-24.00R.

Vimba, Vladimir I.: *See*—
Grigorenko, Anatoly S.; Moroz, Jury A.; Kuznetsov, German N.; Vimba, Vladimir I.; Landyshev, Vladimir V.; Bocharov, Jury A.; and Safonov, Anatoly V., 4,202,174, Cl. 60-413.000.

Vinz, Siegfried. Building roof with solar collector. 4,202,319, Cl. 126-432.000.

Viravec, Joseph T.; and Hoyt, Maurice A., to United States of America, Air Force. Gas relief valve design for low temperature. 4,202,369, Cl. 137-508.000.

Viswanathan, Thiagarajan: *See*—
Acheson, Willard P.; Morris, Richard A.; Rennard, Raymond J.; and Viswanathan, Thiagarajan, 4,202,168, Cl. 60-39.060.
Acheson, Willard P.; Morris, Richard A.; and Viswanathan, Thiagarajan, 4,202,169, Cl. 60-39.120.

Vlasov, Mikhail I.: *See*—
Latash, Jury V.; Voronin, Alexei E.; Nikolaev, Vladimir A.; Pelts, Boris B.; Volokhonsky, Lev A.; Artemiev, Vladimir D.; Vlasov, Mikhail I.; Chernyak, Alexandr I.; Nikulin, Alexandr A.; Dub, Vladimir S.; Vasiliev, Yakov M.; Stul, Iosif N.; Mukha, Vitaly P.; Orlov, Gennady I.; Khasin, Kim M.; Naryshkin, Jury A.; Belsky, Valentin I; Veligura, Ilya L.; Bogdashich, Vladimir E.; Lisitsin, Vladimir A.; Mischenko, Alexandr V.; Kovalenko, Jury A.; Babin, Vladimir V.; Svitenko, Igor A.; Antonov, Vladimir I.; and Smolyarenko, Volemir D., 4,202,401, Cl. 164-252.000.

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Kittag, Gerd, 4,202,610, Cl. 352-91.00C.

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Opfer, John C.; and Vojta, Karel E., 4,203,083, Cl. 335-174.000.

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Bereiter, Rolf; and Jachimowski, Alexander, 4,202,280, Cl. 110-216.000.

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Quebe, Herbert O., 4,202,410, Cl. 166-88.000.

W. Schlafhorst & Co.: *See*—
Koslowski, Gerhard, 4,202,511, Cl. 242-150.00R.
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Wabash, Inc.: *See*—
Wolf, Ronald J., 4,202,305, Cl. 123-148.0CC.

Wada, Toshihiko: *See*—
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Walden, Jack M.: *See*—
Watson, Robert E.; Walden, Jack M.; and Near, Charles W., 4,203,152, Cl. 364-200.000.

Waldrep, Henry D.: *See*—
Peterman, Paul L.; Peterman, S. F.; and Waldrep, Henry D., 4,202,178, Cl. 60-675.000.

Waldrop, T. William; and Shriver, Joe E., to Sperry Rand Corporation. Crop header for a crop harvesting machine having a crop consolidating component which detachably mounts a plurality of interchangeable crop gathering components. 4,202,154, Cl. 56-2.000.

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Burke, Thomas F.; and Walker, Donald H., 4,202,600, Cl. 350-103.000.

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Diehl, Richard C.; and Walker, Jerry L., 4,202,671, Cl. 44-68.000.

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Wanlass, Frank M. Pseudostatic electronic memory. 4,203,159, Cl. 365-222.000.

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Ciko, John D.; Ward, Robert A.; and Cramer, John J., 4,202,800, Cl. 252-543.000.

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Hartenstein, Johannes; and Satzinger, Gerhard, 4,202,980, Cl. 546-75.000.

Waschk, Fritz; Webersik, Heinz; and Schinagl, Rudolf, to AGFA-Gevaert, A.G. Electrostatic copying machine having flash-discharge-lamp fixing unit. 4,202,618, Cl. 355-3.0FU.

Washizuka, Isamu; Teramura, Satoshi; and Matsuishi, Masanori, to Sharp Kabushiki Kaisha. Mirror with information display. 4,202,607, Cl. 350-338.000.

Wason, Satish K., to J. M. Huber Corporation. Rubber containing precipitated siliceous products. 4,202,813, Cl. 260-37.00R.

Waszak, Lawrence: *See*—
Di Matteo, Paul L.; Ross, Joseph A.; Stern, Howard K.; and Waszak, Lawrence, 4,202,612, Cl. 353-28.000.

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Ohba, Kazunori; Shomura, Takashi; Ogawa, Yasuaki; Tsuruoka, Takashi; Watanabe, Hiroshi; Hisamatsu, Takashi; Uchida, Shingo; Kojima, Michio; and Inouye, Shigeharu, 4,202,886, Cl. 424-122.000.

Watanabe, Hiroyuki, to Tomy Kogyo Co., Inc. Golf game device. 4,202,545, Cl. 273-87.00R.

Watanabe, Jiro: *See*—
Shimada, Noburo; Miyamoto, Akira; Kobayashi, Motonobu; Kuribayashi, Akio; Toyoda, Takeharu; Kimura, Morihiro; Kyoden, Hiroshi; Hoshino, Toshisuke; and Watanabe, Jiro, 4,202,538, Cl. 266-275.000.

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Watanabe, Nobuhiko: *See*—
Masuda, Teruo; Watanabe, Nobuhiko; Abe, Takeo; Koike, Matsuhiro; Morita, Masayasu; Oguma, Yoshio; Hamaguchi, Yoshiharu; Hirata, Motonobu; Saito, Mamoru; Onoguchi, Kunio; Yamaguchi, Kazuyuki; and Hirose, Akira, 4,202,257, Cl. 99-348.000.

Watanabe, Yoshimi, to Sony Corporation. Helical scan VTR with deflectable head. 4,203,140, Cl. 360-77.000.

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Waters Manufacturing, Inc.: *See*—
Gass, Ernst, 4,203,074, Cl. 308-181.000.

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Mang, Josef; and Waters, Robert W., 4,202,435, Cl. 198-339.000.

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Watkins, Christopher A. Toilet waterfall. 4,202,056, Cl. 4-1.000.

Watson, Paul C. Remote axis admittance system. 4,202,107, Cl. 33-169.00C.

Watson, Robert E.; Walden, Jack M.; and Near, Charles W., to Hewlett-Packard Company. Programmable calculator including key-log printing means. 4,203,152, Cl. 364-200.000.

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Abernethy, Lynn W.; and Watts, Elvert S., 4,202,593, Cl. 339-125.00R.

Watts, Paul J.; Crawford, Lynn D.; and Nichols, Philip T., to American Ecosystems, Inc. Umbrella type collapsible shelter. 4,202,363, Cl. 135-2.000.

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Bush, Lyman F.; and Weaver, Dennis R., 4,202,378, Cl. 138-96.00R.

Weber, Willis W.; Caglione, Alexander J.; Frost, Albert C.; and Weeks, Thomas J., Jr., to Union Carbide Corporation. Process for producing alumina. 4,202,870, Cl. 423-630.000.

Webersik, Heinz: *See*—
Waschk, Fritz; Webersik, Heinz; and Schinagl, Rudolf, 4,202,618, Cl. 355-3.0FU.

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Weger, Arland D. Automatic sandwich making apparatus. 4,202,260, Cl. 99-450.400.

Wegmann, Jacques, to Rohner AG Pratteln. Concentrated powder or granular formulations dispersable in aqueous media. 4,202,815, Cl. 260-42.210.

Weiblen, Robert E.: *See*—
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Weil, Edward D., to Stauffer Chemical Company. Copolycondensation products of beta-haloalkyl phosphates and dialkyl phosphonates. 4,202,842, Cl. 260-928.000.

Weimann, Gunter: *See*—
Batz, Hans-Georg; Stellner, Klaus; Linke, Hans-Ralf; and Weimann, Gunter, 4,202,873, Cl. 424-1.000.

Weiner, Ben-Zion; Sterling, Jeffrey; Suchi, Raul; and Yellin, Haim, to Teva Pharmaceutical Industries, Ltd. Biocidal methyladamantyl hydrazines and pharmaceutical compositions containing them. 4,202,892, Cl. 424-244.000.

Weiner, Irving L.; and Gershman, Russell J., to Ortho Diagnostics, Inc. Method and apparatus for discriminating red blood cells from platelets. 4,202,625, Cl. 356-39.000.

Weis, Siegfried K., to C. L. Frost & Son, Inc. Chain pin assembly with captive securing means. 4,202,219, Cl. 74-254.000.

Weisenburger, Siegfried: *See*—
Kaufmann, Friedrich; Weisenburger, Siegfried; Koschorke, Herbert; Seiffert, Hartmut; Sienel, Dieter; and Weiss, Karl-Heinz, 4,202,792, Cl. 252-301.10W.

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Kaufmann, Friedrich; Weisenburger, Siegfried; Koschorke, Herbert; Seiffert, Hartmut; Sienel, Dieter; and Weiss, Karl-Heinz, 4,202,792, Cl. 252-301.10W.

Weiss, Martin J.: *See*—
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Weissman, Bernard, to Ipco Hospital Supply Corporation. Dental anchor and a plastic shank for holding same. 4,202,101, Cl. 433-225.000.

Wella AG: *See*—
Gross, Paul; Konrad, Eugen; and Mager, Herbert, 4,202,881, Cl. 424-70.000.

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Welsch, Wolfgang: *See*—
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Wentworth, Darel L.: *See*—
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Wenz, Barry; Karmen, Arthur; and Feng, Chi Shun, to Albert Einstein College of Medicine of Yeshiva University a Division of Yeshiva University. Detection of hepatitis B surface antigen. 4,202,665, Cl. 23-230.00B.

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Simon, Ulrich; Werner, Klaus-Dieter; and Pontani, Bernd, 4,202,731, Cl. 176-37.000.

Wescom, Inc.: *See*—
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Wessler, Louis E., to Xerox Corporation. Phase locked loop circuit for video hard copy controller. 4,203,075, Cl. 331-1.00A.

Westeel-Rosco Limited Westeel-Rosco Limitee: *See*—
Mills, Roy H., 4,202,532, Cl. 256-24.000.

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Moller, Walter H., 4,202,653, Cl. 414-22.000.

Western States Machine Company, The: *See*—
Malinak, Frank J., 4,202,078, Cl. 19-26.000.

Westhead, William T., to Scapa Dryers, Inc. Dryer felts. 4,202,382, Cl. 139-383.00A.

Westinghouse Electric Corp.: *See*—
Abbondanti, Alberto; and Stacey, Eric J., 4,203,040, Cl. 307-65.000.
Buchanan, Lloyd W.; Eberhart, Noah E.; and Szabo, Arthur D., 4,203,045, Cl. 310-68.00C.
Castle, Peter M., 4,202,742, Cl. 204-159.230.
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Vollmer, Regis R., 4,202,085, Cl. 29-157.30C.
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Wheelabrator-Frye Inc.: *See—*
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Whitmore, Bruce C.: *See—*
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Wiechert, Rudolf: *See—*
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Sauer, Gerhard; Hauser, Helmut; Haffer, Gregor; Ruppert, Juergen; Eder, Ulrich; and Wiechert, Rudolf, 4,202,991, Cl. 560-255.000.
Wieland, Jakob, to Bauer Kassenfabrik AG. Container with replaceable security lock for storage of information carriers. 4,202,587, Cl. 312-219.000.
Wiesboeck, Robert A., to United States Steel Corporation. Process and apparatus for distributing cold ammonia. 4,202,283, Cl. 111-6.000.
Wieting, James H. Apparatus and method for cutting access openings for electrical outlet boxes in wall or ceiling covering panels. 4,202,388, Cl. 144-323.000.
Wilcox, Brian N.; and Robinson, John W., to Kimball International, Inc. Chord pattern generator. 4,202,236, Cl. 84-1.030.
Wild, Peter, to BBC Brown Boveri & Company Limited. Liquid crystal display having integrated bridge contacts. 4,202,606, Cl. 350-336.000.
Wilder, James A., Jr., to United States of America, Energy. Glassy composition for hermetic seals. 4,202,700, Cl. 106-39.600.
Wilder, W. Bryant, Jr.: *See—*
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Wilderman, Charles L., to Kelly Well Company, Inc. Device for retaining setting cables. 4,202,087, Cl. 24-263.00R.
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Daniels, R. Gary; Musa, Fuad H.; Wilder, W. Bryant, Jr.; Wiles, Michael F.; and Bennett, Thomas H., 4,203,157, Cl. 364-788.000.
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Williams, Gordon T., to Incom International Inc. Method of manufacturing spherical bearings and parts therefor. 4,202,082, Cl. 29-149.50B.
Williams, Steven E.: *See—*
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Williamson, Alex N., to Monsanto Company. Conversion of unsaturated aldehydes to unsaturated nitriles. 4,202,837, Cl. 260-465.900.
Williamson, Shellie O.: *See—*
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Wilson, Stanley, Jr., to Potter Electric Signal Co. Monitoring apparatus for direct wire alarm system. 4,203,095, Cl. 340-506.000.
Wilson, Walter A., to National Steel Corporation. Apparatus for controlling the concentration and stability of an emulsion. 4,202,193, Cl. 72-42.000.
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Sade, Moshe E.; Soffa, Albert; Vilenski, Dan; and Wing, William, 4,202,482, Cl. 228-4.500.
Wirtzfeld, Alexander; and Bock, Thomas, to Wirtzfeld, Alexander. Cardiac pacemaker. 4,202,339, Cl. 128-419.0PG.
Wischmeyer, Georg: *See—*
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Wischniewski, Martin: *See—*
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Wisconsin Alumni Research Foundation: *See—*
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Guckel, Henry; and Larsen, Steven T., 4,203,128, Cl. 357-60.000.
Wissner, Allan, to American Cyanamid Company. 1-Hydroxymethyl-1-oxo-prostane derivatives of the F_1 series. 4,202,822, Cl. 260-340.90P.
Wissner, Allan; Weiss, Martin J.; and Bernady, Karel F., to American Cyanamid Company. Prostenoic acids and esters. 4,202,988, Cl. 560-118.000.
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Wocher, Berthold; and Pfendler, Thomas, to Robert Bosch GmbH. Method and system for increasing the distance which can be unambiguously measured by a radar system. 4,203,112, Cl. 343-13.00R.
Woitowitz, Friedhelm, to Didier Engineering GmbH. Apparatus for cooling gases from coke plants. 4,202,407, Cl. 165-76.000.
Wolf, Ronald J., to Wabash, Inc. Capacitor discharge ignition system with timing stabilization arrangement. 4,202,305, Cl. 123-148.0CC.
Wong, Alexander C.: *See—*
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Wong, Henry: *See—*
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Wooding Corporation: *See—*
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Wooding, Patrick J., to Wooding Corporation. Atmospheric control of flux pre-melting furnace. 4,202,997, Cl. 13-31.00R.
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Wright, Dave L.; Schuda, Felix J.; and Spranza, Joseph J., III, to Spectra Physics, Inc. Method and apparatus for producing laser plasma tube and product. 4,203,080, Cl. 331-94.50D.
Wright, Larry R.: *See—*
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Wu, Yulin: *See—*
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Wurz, Dieter: *See—*
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Yagisawa, Hideji, to Doryokuro Kakunenryo Kaihatsu Jigyodan. Method and apparatus for detecting deflect in liquid metal handling instruments. 4,202,202, Cl. 73-40.000.
Yale, William S. Skin graft pressure pad. 4,202,331, Cl. 128-155.000.
Yamaguchi, Kazuo; Tanaka, Toru; Okano, Shigeaki; Enokido, Nobuo; and Suzuki, Masatoshi, to Mitsubishi Chemical Industries, Ltd. Process for the preparation of polyolefins using a reduced vanadium halide catalyst. 4,202,958, Cl. 526-142.000.
Yamaguchi, Kazuyuki: *See—*
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Yamaguchi, Nobutaka; Takayama, Satoru; and Fujiyama, Masaki, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 4,202,927, Cl. 428-323.000.
Yamaguchi, Shunzo: *See—*
Mori, Kouichi; Igashira, Toshihiko; and Yamaguchi, Shunzo, 4,202,312, Cl. 123-210.000.
Yamaguchi, Takao; Aoyama, Kenjiro; Nishio, Yukihiro; and Kazino, Sadayosi, to Nippondenso Co., Ltd. Ventilated electromagnetic switch. 4,203,084, Cl. 335-202.000.
Yamaha Hatsudoki Kabushiki Kaisha: *See—*
Oku, Yuji; and Tsuyama, Yasuharu, 4,202,297, Cl. 123-65.0PE.
Yamamori, Takahiro; and Ohtsuka, Kunio, to Nissan Motor Company, Limited. Passage structure of lock-up torque converter. 4,202,431, Cl. 192-3.290.
Yamamoto, Hisao: *See—*
Inaba, Shigeho; Yamamoto, Michihiro; Ishizumi, Kikuo; Mori, Kazuo; and Yamamoto, Hisao, 4,202,895, Cl. 424-250.000.
Yamamoto, Michihiro; Katayama, Shigenari; Koshiba, Masao; and Yamamoto, Hisao, 4,202,974, Cl. 544-251.000.
Yamamoto, Michihiro; Katayama, Shigenari; Koshiba, Masao; and Yamamoto, Hisao, to Sumitomo Chemical Company, Limited. Process for preparing 3,4-dihydro-2(1H)-quinazolinone derivatives. 4,202,974, Cl. 544-251.000.
Yamamoto, Michihiro: *See—*
Inaba, Shigeho; Yamamoto, Michihiro; Ishizumi, Kikuo; Mori, Kazuo; and Yamamoto, Hisao, 4,202,895, Cl. 424-250.000.
Yamamoto, Shinji; Kaijiri, Kouhei; and Oda, Denichi, to Ube Industries, Ltd. Process for producing fiber-reinforced elastic articles. 4,202,850, Cl. 264-108.000.

Yamamoto, Yoshun: *See*—
Haneda, Yoshikazu; Yamamoto, Yoshun; Matsufuji, Akira; Haji, Takashi; and Nakajima, Koe, 4,202,192, Cl. 72-21.000.

Yamasaki, Koyu: *See*—
Makishima, Mamoru; and Yamasaki, Koyu, 4,202,556, Cl. 277-190.000.

Yamashita, Noriyuki, to Sony Corporation. Clock pulse signal generator having an automatic frequency control circuit. 4,203,076, Cl. 331-25.000.

Yamauchi, Yukio; and Homma, Hiroshi, to Hochiki Corporation. Light decrease type smoke sensor. 4,203,100, Cl. 340-630.000.

Yamawaki, Naokuni: *See*—
Kominami, Naoya; Fukumi, Hirokazu; Yamawaki, Naokuni; and Nomura, Junji, 4,202,291, Cl. 119-3.000.

Yamazaki, Noboru: *See*—
Kawasoko, Yoshiaki; Chiba, Iwane; Yamazaki, Noboru; Chiyonobu, Toshimi; and Shikuma, Masao, 4,202,537, Cl. 266-252.000.

Yamazoe, Hiroshi: *See*—
Tsukamoto, Masahide; Nagasawa, Masahiro; and Yamazoe, Hiroshi, 4,203,082, Cl. 333-194.000.

Yanagida, Jun; Ishikawa, Souichiro; and Nakazawa, Kazutada. Stapler for broad center beam staples. 4,202,481, Cl. 227-145.000.

Yasui Sangyo Co. Ltd.: *See*—
Hihara, Yukiyoshi, 4,202,214, Cl. 73-487.000.

Yellin, Haim: *See*—
Weiner, Ben-Zion; Sterling, Jeffrey; Suchi, Raul; and Yellin, Haim, 4,202,892, Cl. 424-244.000.

Yim, Ernest W.; and VanLoon, Paul G. G., to Siliconix, Inc. CMOS structure and method utilizing retarded electric field for minimum latch-up. 4,203,126, Cl. 357-42.000.

Yokobayashi, Koji: *See*—
Misaki, Akira; Takaya, Shigeo; Yokobayashi, Koji; and Tsuburaya, Yoichi, 4,202,940, Cl. 435-101.000.
Misaki, Akira; Takaya, Shigeo; Yokobayashi, Koji; and Tsuburaya, Yoichi, 4,202,966, Cl. 536-1.000.

Yokohama Rubber Co., Ltd., The: *See*—
Ikeda, Ryo; Nogami, Yoichi; and Koizumi, Teruo, 4,202,393, Cl. 152-330.0RF.

Yokose, Kazuteru: *See*—
Suhara, Yasuji; Maruyama, Hiromi; Itoh, Sayuri; and Yokose, Kazuteru, 4,202,943, Cl. 435-280.000.

Yokoyama, Toshihiko: *See*—
Murakami, Fumiki; Teshima, Soichi; and Yokoyama, Toshihiko, 4,202,990, Cl. 560-217.000.

Yonezawa, Noboru: *See*—
Ohmura, Taizo; Yonezawa, Noboru; and Ikuta, Kazuo, 4,202,686, Cl. 75-0.50B.

Yonkers, Edward H. Collapsible bicycle. 4,202,561, Cl. 280-278.000.

Yoshida-Kogyo K.K.: *See*—
Kanzaka, Yoshihiro, 4,202,285, Cl. 112-235.000.

Yoshida, Norio; and Matuyama, Takesi, to Koei Chemical Co., Ltd. Stabilization of chlorine-containing resins. 4,202,806, Cl. 260-23.0XA.

Yoshida, Toshio: *See*—
Ogawa, Koichi; Tezuka, Shichigoro; Sato, Yoshinori; Moroe, Michio; Tsuruta, Haruki; and Yoshida, Toshio, 4,202,906, Cl. 426-3.000.

Yoshikumi, Chikao: *See*—
Ueno, Saburo; Yoshikumi, Chikao; Hirose, Fumio; Omura, Yoshio; Wada, Toshihiko; Fujii, Takayoshi; and Takahashi, Eiichi, 4,202,969, Cl. 536-1.000.

Yoshimura, Shigeru; and Shimizu, Katsuichi, to Canon Kabushiki Kaisha. Recording device. 4,202,621, Cl. 355-14.00R.

Yoshimura, Susumu; Murakami, Mutsuaki; and Shinoda, Midori, to Matsushita Electric Industrial Co., Ltd. Organic-heat-sensitive semiconductive compounds. 4,202,799, Cl. 252-500.000.

Yoshimura, Tooru: *See*—
Nakajima, Yasuo; Hayashi, Yoshimasa; and Yoshimura, Tooru, 4,202,306, Cl. 123-148.00C.

Yoshinari, Hideki: *See*—
Suzki, Akiyoshi; Kano, Ichiro; Yoshinari, Hideki; Tozuka, Masao; Hiraga, Ryozo; Kato, Yuzo; and Ogino, Yasuo, 4,202,627, Cl. 356-71.000.

Yoshizawa, Naomi: *See*—
Namiki, Yasushi; Terashima, Akira; and Yoshizawa, Naomi, 4,202,235, Cl. 84-1.010.

Young, John J., to Goodyear Tire & Rubber Company, The. Conveyor for a combine harvester. 4,202,159, Cl. 56-364.000.

Young, Robert W.; and Dansbury, Leonard D., to United States of America, Navy. Fluidic interface means. 4,202,517, Cl. 244-3.220.

Youngblood, Thomas F., to Dresser Industries, Inc. Roller cutter with major and minor insert rows. 4,202,419, Cl. 175-374.000.

Yurasko, George, Jr., to Eutectic Corporation. Metallo-thermic powder. 4,202,691, Cl. 75-252.000.

Zabotin, Alexandr A.: *See*—
Galperin, Alexandr L.; Serebryannikov, Albert S.; Onikov, Eduard A.; Zabotin, Alexandr A.; Loschilin, Evgeny D.; and Santucci, Nicola, 4,202,383, Cl. 139-436.000.

Zahnradfabrik Friedrichshafen AG: *See*—
Jablonsky, Erich; and Elser, Dieter, 4,202,249, Cl. 91-422.000.

Zahradnik, George J., to A. B. Dick Company. Staging mechanism for duplexing copy machines. 4,202,266, Cl. 101-218.000.

Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai: *See*—
Umezawa, Hamao; Aoyagi, Takaaki; and Takeuchi, Tomio, 4,202,824, Cl. 260-343.900.

Zall, Michael E.; and Silverhardt, Stephen. Matrix band guide and matrix retainer device. 4,202,103, Cl. 433-153.000.

Zannucci, Joseph S.; and Thompson, John W., to Eastman Kodak Company. Stabilization of aqueous p-benzoquinones. 4,202,788, Cl. 252-182.000.

Zemtsov, Mikhail U.: *See*—
Klimkovsky, Bronislav M.; Azikov, Boris A.; Zemtsov, Mikhail U.; Kusch, Sergei A.; and Nalivkin, Nikolai P., 4,202,439, Cl. 198-642.000.

Zentec Corporation: *See*—
Lovercheck, Lawrence R., 4,203,107, Cl. 340-799.000.

Zeuner, Kenneth W.; and Jarman, Alonzo B., to Control Concepts, Inc. Programmed unbalanced load valve system. 4,202,250, Cl. 91-449.000.

Ziemba, Georg. Method for making a spherical mirror. 4,202,715, Cl. 156-71.000.

Zorrilla, Fermin; and Alonso, Agustin M. Anti-corrosive polymeric coating. 4,202,310, Cl. 123-191.00A.

Zuber, John R.; and Foxman, Herbert, to RCA Corporation. Method of stripping photoresist. 4,202,703, Cl. 134-2.000.

Zundel, Arthur P., to National Can Corporation. Method of attaching tab to end panel. 4,202,287, Cl. 113-121.00C.

Zweig, Jack; McLaughlin, William; and Herz, Matthew L. Drug activation by radiation. 4,202,323, Cl. 128-1.100.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 13TH DAY OF MAY, 1980

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Bartholomew, Ralph L.: *See*—
Bolon, Donald A.; Lucas, Gary M.; and Bartholomew, Ralph L., Re. 30,274, Cl. 361-411.000.

Bolon, Donald A.; Lucas, Gary M.; and Bartholomew, Ralph L., to General Electric Company. Method for making a circuit board and article made thereby. Re. 30,274, Cl. 361-411.000.

Eaton Corporation: *See*—
Grebner, Stuart W.; Johnson, James V., Jr.; and Josemans, Leonardus J., Re. 30,273, Cl. 200-42.00T.

General Electric Company: *See*—
Bolon, Donald A.; Lucas, Gary M.; and Bartholomew, Ralph L., Re. 30,274, Cl. 361-411.000.

Grebner, Stuart W.; Johnson, James V., Jr.; and Josemans, Leonardus J., to Eaton Corporation. Rocker switch with integral off lock. Re. 30,273, Cl. 200-42.00T.

Hitzman, Donald O., to Phillips Petroleum Company. Recovery of cellular protein products from microbiological synthesis masses. Re. 30,272, Cl. 426-656.000.

Johnson, James V., Jr.: *See*—
Grebner, Stuart W.; Johnson, James V., Jr.; and Josemans, Leonardus J., Re. 30,273, Cl. 200-42.00T.

Josemans, Leonardus J.: *See*—
Grebner, Stuart W.; Johnson, James V., Jr.; and Josemans, Leonardus J., Re. 30,273, Cl. 200-42.00T.

Lucas, Gary M.: *See*—
Bolon, Donald A.; Lucas, Gary M.; and Bartholomew, Ralph L., Re. 30,274, Cl. 361-411.000.

Phillips Petroleum Company: *See*—
Hitzman, Donald O., Re. 30,272, Cl. 426-656.000.

LIST OF PLANT PATENTEES

Hindla, Louis A. Azalea plant. 4,535, 5-13-80, Cl. 56.000.

Siebenthaler Company, The: *See*—
Siebenthaler, John D., 4,534, Cl. 51.000.

Siebenthaler, John D., to Siebenthaler Company, The. Sugar maple. 4,534, 5-13-80, Cl. 51.000.

LIST OF DESIGN PATENTEES

A/S JAC. Engelbredt: *See*—
Keller, Joergen, 254,938, Cl. D2-268.000.

A-S Royken Jernvarefabrik: *See*—
Hauglin, Bernt O., 254,983, Cl. D21-230.000.

Ahrenskou-Sorensen, Borge, to Svenska Skandex Aktiebolag. Color mixing apparatus. 254,973, 5-13-80, Cl. D15-147.000.

Allison, Terry C. Pendant or the like. 254,966, 5-13-80, Cl. D11-61.000.

Alsman, Bill R. Dual lamp driving light. 254,995, 5-13-80, Cl. D26-35.000.

American Safety Razor Company: *See*—
Chase, David O.; and Pfuhl, Paul H., 254,992, Cl. D28-46.000.

Amfac Foods, Inc.: *See*—
Saunders, Francis R., 254,936, Cl. D1-1.000.

Armstrong, John C.: *See*—
Palson, Richard C.; and Armstrong, John C., 254,986, Cl. D23-150.000.

Ball Corporation: *See*—
Campbell, Arlin L.; and Cannon, Roger B., 254,957, Cl. D9-216.000.

Besford, John, to U.S. Philips Corporation. Kitchen-machine. 254,948, 5-13-80, Cl. D7-153.000.

Besford, John, to U.S. Philips Corporation. Kitchen-machine. 254,949, 5-13-80, Cl. D7-153.000.

Besford, John, to U.S. Philips Corporation. Kitchen-machine. 254,950, 5-13-80, Cl. D7-153.000.

Browning, Albert E. Glider chair. 254,942, 5-13-80, Cl. D6-54.000.

Bunger, Richard E.; and Hancock, Roy J. Flume platform panel for animal confinement pens. 254,993, 5-13-80, Cl. D30-2.000.

Campbell, Arlin L.; and Cannon, Roger B., to Ball Corporation. Beverage container. 254,957, 5-13-80, Cl. D9-216.000.

Cannon, Roger B.: *See*—
Campbell, Arlin L.; and Cannon, Roger B., 254,957, Cl. D9-216.000.

CHA Industries: *See*—
Mahl, Gunard O. B., 254,974, Cl. D15-199.000.

Chase, David O.; and Pfuhl, Paul H., to American Safety Razor Company. Disposable lady's razor. 254,992, 5-13-80, Cl. D28-46.000.

Combi Co., Ltd.: *See*—
Nakao, Shinroku; Kobayashi, Kouichi; and Moriya, Kazuo, 254,969, Cl. D12-129.000.

Delamater, William B. Combined grill cleaner and container opener. 254,953, 5-13-80, Cl. D8-18.000.

Dugan, David R.; and Prince, Kenneth E., to Owens-Illinois Inc. Lid for a packaging container or the like. 254,958, 5-13-80, Cl. D9-254.000.

Everest, Charles E., to Telatemp Corporation. Radiation pyrometer. 254,959, 5-13-80, Cl. D10-57.000.

Falcq, Rene S., to Societe Anonyme Metal Deployе Belge. Corner angle iron for ceiling plasterwork. 254,991, 5-13-80, Cl. D25-74.000.

Florists' Transworld Delivery Association: *See*—
Ribeiro, J. A. Pinto, 254,954, Cl. D9-39.000.

Fratarcangeli, Victor J., to Quaker Oats Company, The. Toy railroad station. 254,982, 5-13-80, Cl. D21-118.000.

Gambrell, Joseph L.; Gilleland, Gene P.; Hawthorne, Allen D.; Hofland, Robert M.; and McCuiston, James A., to International Business Machines Corporation. Convenience collator for a copier. 254,975, 5-13-80, Cl. D16-32.000.

Gedye, Laurence R., to L. R. & N. R. Gedye Pty. Limited. Compost bin. 254,951, 5-13-80, Cl. D7-192.000.

Genal Strap, Inc.: *See*—
Hofman, Bronislaw L., 254,961, Cl. D11-3.000.
Hofman, Bronislaw L., 254,962, Cl. D11-3.000.
Hofman, Bronislaw L., 254,963, Cl. D11-3.000.
Hofman, Bronislaw L., 254,964, Cl. D11-3.000.
Hofman, Bronislaw L., 254,965, Cl. D11-3.000.

Gilleland, Gene P.: *See*—
Gambrell, Joseph L.; Gilleland, Gene P.; Hawthorne, Allen D.; Hofland, Robert M.; and McCuiston, James A., 254,975, Cl. D16-32.000.

Gilley, James E., to Keyes Fibre Company. Tray for packaging containers of yogurt or the like. 254,956, 5-13-80, Cl. D9-184.000.

Goldstein, Morton M.: *See*—
White, David L.; Goldstein, Morton M.; and Kraft, Harry, 254,980, Cl. D21-1.000.

Goyette, Armand J., Jr. Golf club practice head. 254,984, 5-13-80, Cl. D21-234.000.

Gutos Metallschliessenfabrik Bader & Hoch AG: *See*—
Lober, Otto, 254,939, Cl. D2-418.000.

Hancock, Roy J.: *See*—
Bunger, Richard E.; and Hancock, Roy J., 254,993, Cl. D30-2.000.

Hartung, Philip F.; and Tramonti, John J. Bottle. 254,955, 5-13-80, Cl. D9-91.000.
Hauglin, Bernt O., to A-S Royken Jernvarefabrik. Skibinding. 254,983, 5-13-80, Cl. D21-230.000.
Hawthorne, Allen D.: *See*—
Gambrell, Joseph L.; Gilleland, Gene P.; Hawthorne, Allen D.; Hofland, Robert M.; and McCuiston, James A., 254,975, Cl. D16-32.000.
Helm, Patrick J., to Kent-Moore Instrument Company. Digital tachometer design. 254,960, 5-13-80, Cl. D10-98.000.
Hepworth, Paul S., to Plas Plugs Ltd. Hook for a hollow door. 254,943, 5-13-80, Cl. D6-122.000.
Hildebrandt, William J.; and Rathbun, Richard H., to Stanley Works, The. Shears. 254,952, 5-13-80, Cl. D8-5.000.
Hofland, Robert M.: *See*—
Gambrell, Joseph L.; Gilleland, Gene P.; Hawthorne, Allen D.; Hofland, Robert M.; and McCuiston, James A., 254,975, Cl. D16-32.000.
Hofman, Bronislaw L., to Genal Strap, Inc. Watchstrap. 254,961, 5-13-80, Cl. D11-3.000.
Hofman, Bronislaw L., to Genal Strap, Inc. Watchstrap. 254,962, 5-13-80, Cl. D11-3.000.
Hofman, Bronislaw L., to Genal Strap, Inc. Watchstrap. 254,963, 5-13-80, Cl. D11-3.000.
Hofman, Bronislaw L., to Genal Strap, Inc. Watchstrap. 254,964, 5-13-80, Cl. D11-3.000.
Hofman, Bronislaw L., to Genal Strap, Inc. Watchstrap. 254,965, 5-13-80, Cl. D11-3.000.
Honzyou, Hiroshi, to Sony Corporation. Wheelchair. 254,970, 5-13-80, Cl. D12-131.000.
International Business Machines Corporation: *See*—
Gambrell, Joseph L.; Gilleland, Gene P.; Hawthorne, Allen D.; Hofland, Robert M.; and McCuiston, James A., 254,975, Cl. D16-32.000.
International Playtex, Inc.: *See*—
Raimondi, Phyllis, 254,937, Cl. D2-24.000.
International Silver Company: *See*—
Knope, William J., 254,947, Cl. D7-150.000.
Jones, Robert H.; and Nylin, Lennard E., to Viking Sauna Company. Hydrotherapy spa. 254,988, 5-13-80, Cl. D24-38.000.
Katz, Michael I. Flower pot. 254,967, 5-13-80, Cl. D11-152.000.
Keller, Joergen, to A/S JAC. Engelbredt. Shoe. 254,938, 5-13-80, Cl. D2-268.000.
Kent-Moore Instrument Company: *See*—
Helm, Patrick J., 254,960, Cl. D10-98.000.
Keyes Fibre Company: *See*—
Gilley, James E., 254,956, Cl. D9-184.000.
Knope, William J., to International Silver Company. Knife or similar article of flatware. 254,947, 5-13-80, Cl. D7-150.000.
Kobayashi, Kouichi: *See*—
Nakao, Shinroku; Kobayashi, Kouichi; and Moriya, Kazuo, 254,969, Cl. D12-129.000.
Kraft, Harry: *See*—
White, David L.; Goldstein, Morton M.; and Kraft, Harry, 254,980, Cl. D21-1.000.
Kramor Industries, Ltd.: *See*—
White, David L.; Goldstein, Morton M.; and Kraft, Harry, 254,980, Cl. D21-1.000.
L. R. & N. R. Gedye Pty. Limited: *See*—
Gedye, Laurence R., 254,951, Cl. D7-192.000.
Lee, Thomas M.; and Seifert, Richard A. Combined change tray and portable calculator support. 254,944, 5-13-80, Cl. D6-181.000.
Lober, Otto, to Gutos Metallschliessenfabrik Bader & Hoch AG. Belt buckle. 254,939, 5-13-80, Cl. D2-418.000.
Mahl, Gunard O. B., to CHA Industries. Vacuum deposition apparatus. 254,974, 5-13-80, Cl. D15-199.000.
McCuiston, James A.: *See*—
Gambrell, Joseph L.; Gilleland, Gene P.; Hawthorne, Allen D.; Hofland, Robert M.; and McCuiston, James A., 254,975, Cl. D16-32.000.
Medina, Conrad R.: *See*—
Villwock, George F.; and Medina, Conrad R., 254,977, Cl. D18-34.000.
Miereanu, Michael; and Miereanu, Renee. Aquarium stand. 254,994, 5-13-80, Cl. D30-12.000.
Miereanu, Renee: *See*—
Miereanu, Michael; and Miereanu, Renee, 254,994, Cl. D30-12.000.
Mobius, Werner. Pencil sharpener. 254,978, 5-13-80, Cl. D19-73.000.
Moore, George C.; Moore, Jodele; and Tipke, James M. Three-wheeled vehicle. 254,968, 5-13-80, Cl. D12-112.000.
Moore, Jodele: *See*—
Moore, George C.; Moore, Jodele; and Tipke, James M., 254,968, Cl. D12-112.000.
Morishita, Yasomatsu, to Ryobi Ltd. Fishing reel. 254,985, 5-13-80, Cl. D22-25.000.
Moriya, Kazuo: *See*—
Nakao, Shinroku; Kobayashi, Kouichi; and Moriya, Kazuo, 254,969, Cl. D12-129.000.
Nakao, Shinroku; Kobayashi, Kouichi; and Moriya, Kazuo, to Combi Co., Ltd. Baby stroller. 254,969, 5-13-80, Cl. D12-129.000.
North American Philips Corporation: *See*—
Rakocy, William J.; and Tsuji, Masao, 254,972, Cl. D15-82.000.
Nylin, Lennard E.: *See*—
Jones, Robert H.; and Nylin, Lennard E., 254,988, Cl. D24-38.000.
Owens-Illinois Inc.: *See*—
Dugan, David R.; and Prince, Kenneth E., 254,958, Cl. D9-254.000.
Palson, Richard C.; and Armstrong, John C., to Pharmasol Corporation, The. Room deodorant dispenser. 254,986, 5-13-80, Cl. D23-150.000.
Pfuhl, Paul H.: *See*—
Chase, David O.; and Pfuhl, Paul H., 254,992, Cl. D28-46.000.
Pharmasol Corporation, The: *See*—
Palson, Richard C.; and Armstrong, John C., 254,986, Cl. D23-150.000.
Plas Plugs Ltd.: *See*—
Hepworth, Paul S., 254,943, Cl. D6-122.000.
Prince, Kenneth E.: *See*—
Dugan, David R.; and Prince, Kenneth E., 254,958, Cl. D9-254.000.
Quaker Oats Company, The: *See*—
Fratarcangeli, Victor J., 254,982, Cl. D21-118.000.
Raimondi, Phyllis, to International Playtex, Inc. Brassiere. 254,937, 5-13-80, Cl. D2-24.000.
Rakocy, William J.; and Tsuji, Masao, to North American Philips Corporation. Ice cream maker. 254,972, 5-13-80, Cl. D15-82.000.
Rathbun, Richard H.: *See*—
Hildebrandt, William J.; and Rathbun, Richard H., 254,952, Cl. D8-5.000.
Ribeiro, J. A. Pinto, to Florists' Transworld Delivery Association. Jar or the like. 254,954, 5-13-80, Cl. D9-39.000.
Richards Manufacturing Co., Inc.: *See*—
Treace, James T.; and Treace, Dan H., 254,987, Cl. D24-33.000.
Riddle, Ronald D. Canopy for pick-up truck bed. 254,971, 5-13-80, Cl. D12-156.000.
Ryobi Ltd.: *See*—
Morishita, Yasomatsu, 254,985, Cl. D22-25.000.
Sandman, Elaine E. House or the like. 254,989, 5-13-80, Cl. D25-17.000.
Saunders, Francis R., to Amfac Foods, Inc. Frozen potato patty. 254,936, 5-13-80, Cl. D1-1.000.
Seifert, Richard A.: *See*—
Lee, Thomas M.; and Seifert, Richard A., 254,944, Cl. D6-181.000.
Simmons, Gregory L. Upholstered stool or the like. 254,941, 5-13-80, Cl. D6-26.000.
Societe Anonyme Metal Deploye Belge: *See*—
Falcq, Rene S., 254,991, Cl. D25-74.000.
Sony Corporation: *See*—
Honzyou, Hiroshi, 254,970, Cl. D12-131.000.
Stanley Works, The: *See*—
Hildebrandt, William J.; and Rathbun, Richard H., 254,952, Cl. D8-5.000.
Svenska Skandex Aktiebolag: *See*—
Ahrenskou-Sorensen, Borge, 254,973, Cl. D15-147.000.
Swingline, Inc.: *See*—
Villwock, George F.; and Medina, Conrad R., 254,977, Cl. D18-34.000.
Tayebi, Ramin. Goblet. 254,946, 5-13-80, Cl. D7-13.000.
Telatemp Corporation: *See*—
Everest, Charles E., 254,959, Cl. D10-57.000.
Thomas, Thomas A. Golf ball and tee caddy. 254,940, 5-13-80, Cl. D2-400.000.
Tipke, James M.: *See*—
Moore, George C.; Moore, Jodele; and Tipke, James M., 254,968, Cl. D12-112.000.
Tramonti, John J.: *See*—
Hartung, Philip F.; and Tramonti, John J., 254,955, Cl. D9-91.000.
Treace, Dan H.: *See*—
Treace, James T.; and Treace, Dan H., 254,987, Cl. D24-33.000.
Treace, James T.; and Treace, Dan H., to Richards Manufacturing Co., Inc. Hip prosthesis. 254,987, 5-13-80, Cl. D24-33.000.
Tsuji, Masao: *See*—
Rakocy, William J.; and Tsuji, Masao, 254,972, Cl. D15-82.000.
U.S. Philips Corporation: *See*—
Besford, John, 254,948, Cl. D7-153.000.
Besford, John, 254,949, Cl. D7-153.000.
Besford, John, 254,950, Cl. D7-153.000.
Valente, Michael J. Musical rhythm instrument. 254,976, 5-13-80, Cl. D17-22.000.
Verbeke, Henry. Bag vending machine. 254,979, 5-13-80, Cl. D20-1.000.
Viking Sauna Company: *See*—
Jones, Robert H.; and Nylin, Lennard E., 254,988, Cl. D24-38.000.
Villwock, George F.; and Medina, Conrad R., to Swingline, Inc. Combined power stapler and desk stapler unit. 254,977, 5-13-80, Cl. D18-34.000.
White, David L.; Goldstein, Morton M.; and Kraft, Harry, to Kramor Industries, Ltd. Combined keno ticket holder with pager and game results display. 254,980, 5-13-80, Cl. D21-1.000.
Winter, Claus. Facade for a furniture store. 254,990, 5-13-80, Cl. D25-59.000.
Wolf, Tobin. Game board. 254,981, 5-13-80, Cl. D21-32.000.
Worrell, James. Chair frame. 254,945, 5-13-80, Cl. D6-191.000.

CLASSIFICATION OF PATENTS

ISSUED MAY 13, 1980

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

69.5	4,202,052
84	4,202,053
116	4,202,054

CLASS 3

1.91	4,202,055

CLASS 4

1	4,202,056
144.3	4,202,057
	4,202,058
149	4,202,059
173 R	4,202,060
317	4,202,061

CLASS 5

66	4,202,062
81 R	4,202,063
83	4,202,064
99 A	4,202,065

CLASS 8

94.15	4,202,664
444	4,202,662
471	4,202,663

CLASS 12

142 R	4,202,066

CLASS 13

31 R	4,202,997

CLASS 15

28	4,202,067
	4,202,068
250.03	4,202,069
300 A	4,202,070
302	4,202,071
	4,202,072
306 A	4,202,073

CLASS 16

94 D	4,202,074

CLASS 17

41	4,202,075
48	4,202,076
73	4,202,077

CLASS 19

26	4,202,078
64.5	4,202,079

CLASS 23

230 B	4,202,665
232 E	4,202,666
302 T	4,202,667

CLASS 24

263 R	4,202,087

CLASS 29

25.18	4,202,080
25.41	4,202,081
149.5 B	4,202,082
150	4,202,083
156.8 R	4,202,084
157.3 C	4,202,085
157.3 R	4,202,086
280	4,202,088
417	4,202,090
527.1	4,202,091
527.6	4,202,089
741	4,202,092

CLASS 30

169	4,202,093
276	4,202,094
340	4,202,095
381	4,202,096

CLASS 33

168 R	4,202,106
169 C	4,202,107
189	4,202,108
199 R	4,202,109
299	4,202,110
444	4,202,111
483	4,202,105

CLASS 34

4	4,202,112
23	4,202,113

CLASS 35

11 A	4,202,114
25	4,202,115

CLASS 36

59 R	4,202,116
112	4,202,117

CLASS 37

41	4,202,118
69	4,202,119

CLASS 40

2.2	4,202,120
152.1	4,202,121
158 B	4,202,122
596	4,202,123

CLASS 42

89	4,202,124

CLASS 43

17	4,202,125
	4,202,126
42.31	4,202,127
43.14	4,202,128
131	4,202,129

CLASS 44

7 A	4,202,668
40	4,202,669
51	4,202,670
68	4,202,671

CLASS 46

1 R	4,202,130
16	4,202,132
25	4,202,131
67	4,202,133
92	4,202,134
154	4,202,135

CLASS 48

77	4,202,672
86 R	4,202,673

CLASS 49

449	4,202,136
458	4,202,137

CLASS 51

229	4,202,138
393	4,202,139
395	4,202,140
412	4,202,141
425	4,202,142

CLASS 52

97	4,202,143
103	4,202,144
169.1	4,202,145
236.4	4,202,146
245	4,202,147
592	4,202,148
699	4,202,149

CLASS 53

206	4,202,150
378	4,202,151
451	4,202,152
459	4,202,153

CLASS 55

108	4,202,674
118	4,202,675
269	4,202,676
378	4,202,677

CLASS 56

2	4,202,154
9	4,202,155
13.6	4,202,156
28	4,202,157
328 R	4,202,158
364	4,202,159
366	4,202,160

CLASS 57

12	4,202,161
58.89	4,202,162
58.95	4,202,163
232	4,202,164

CLASS 60

39.02	4,202,167
39.06	4,202,168
39.12	4,202,169
39.23	4,202,170
39.28 R	4,202,171
245	4,202,172
290	4,202,173
413	4,202,174
477	4,202,175
800	4,202,176
641	4,202,177
675	4,202,178

CLASS 62

2	4,202,179
38	4,202,678
50	4,202,180
141	4,202,181
511	4,202,182

CLASS 64

1 C	4,202,183
32 R	4,202,184

CLASS 65

2	4,202,679
12	4,202,680
104	4,202,681
136	4,202,682

CLASS 66

203	4,202,185

CLASS 68

3 R	4,202,186
18 F	4,202,187
205 R	4,202,188
	4,202,189

CLASS 69

19.3	4,202,190

CLASS 71

35	4,202,683
100	4,202,684
121	4,202,685

CLASS 72

10	4,202,191
21	4,202,192
42	4,202,193
78	4,202,194
	4,202,195
137	4,202,196
245	4,202,197
250	4,202,198

CLASS 73

23	4,202,200
40	4,202,201
	4,202,202
61.1 R	4,202,203
64.1	4,202,204
65	4,202,205
116	4,202,206
119 A	4,202,207
139	4,202,208
168	4,202,209
194 A	4,202,210
227	4,202,211
421.5 R	4,202,212
487	4,202,213
	4,202,214
599	4,202,215
639	4,202,216
727	4,202,217
766	4,202,218

CLASS 74

254	4,202,219
471 R	4,202,220
821	4,202,221

CLASS 75

0.5 B	4,202,686
134 C	4,202,687
153	4,202,688
211	4,202,689
224	4,202,690
252	4,202,691
257	4,202,692

CLASS 76

101 A	4,202,222

CLASS 81

3 R	4,202,223
	4,202,224
57.35	4,202,225

CLASS 82

12	4,202,226
36 A	4,202,227

CLASS 83

23	4,202,228
304	4,202,229
345	4,202,230
453	4,202,231
519	4,202,232
745	4,202,233

CLASS 84

1.01	4,202,234
	4,202,235
1.03	4,202,236
1.24	4,202,237
1.26	4,202,239
1.27	4,202,238
297 R	4,202,240
422 S	4,202,241

CLASS 85

7	4,202,242
37	4,202,243
45	4,202,244

CLASS 86

36	4,202,245

CLASS 89

41 EA	4,202,246

CLASS 91

364	4,202,247
375 A	4,202,248
422	4,202,249
449	4,202,250
472	4,202,251
483	4,202,252

CLASS 93

1 H	4,202,253

CLASS 98

2.12	4,202,254
42 R	4,202,255

CLASS 99

323.5	4,202,256
348	4,202,257
	4,202,258
352	4,202,259
450.4	4,202,260
636	4,202,261

CLASS 100

4	4,202,262
95	4,202,263
269 A	4,202,264

CLASS 101

72	4,202,265
218	4,202,266
364	4,202,267
409	4,202,268

CLASS 102

8	4,202,269
43 R	4,202,270
247	4,202,271

CLASS 104

91	4,202,272
165	4,202,274
298	4,202,273

CLASS 105

61	4,202,275
165	4,202,276
215 C	4,202,277

CLASS 106

39.6	4,202,700
278	4,202,701
288 B	4,202,702

CLASS 108

102	4,202,278

CLASS 109

34	4,202,279

CLASS 110

216	4,202,280
259	4,202,281
346	4,202,282

CLASS 111

6	4,202,283

CLASS 112

217.1	4,202,284
235	4,202,285
286	4,202,286

CLASS 113

121 C	4,202,287

CLASS 118

41	4,202,288
50	4,202,289
211	4,202,290

CLASS 119

3	4,202,291
20	4,202,292
29	4,202,293
78	4,202,294

CLASS 123

32 EH	4,202,295
41.48	4,202,296
65 PE	4,202,297
73 A	4,202,299
73 R	4,202,298
75 B	4,202,300
119 EC	4,202,301
119 F	4,202,302
139 AQ	4,202,303
148 C	4,202,306
148 CC	4,202,305
148 E	4,202,304
169 V	4,202,307
179 G	4,202,308
180 R	4,202,309
191 A	4,202,310
195 C	4,202,311
210	4,202,312
212	4,202,313
249	4,202,315

CLASS 124

24 R	4,202,316

CLASS 125

11 H	4,202,317

CLASS 126

110 R	4,202,318
425	4,202,321
	4,202,322
432	4,202,319
447	4,202,320

CLASS 128

1.1	4,202,323
20	4,202,324
24 R	4,202,325
33	4,202,326
78	4,202,327
89 A	4,202,328
130	4,202,329
155	4,202,331
204.18	4,202,330
214.4	4,202,332
218 A	4,202,333
218 F	4,202,314
272	4,202,334
295	4,202,335
303.1	4,202,336
303.14	4,202,337
303.15	4,202,338
419 D	4,202,340
419 PG	4,202,339
	4,202,341
	4,202,342
438	4,202,343
644	4,202,344
654	4,202,345
658	4,202,346
677	4,202,347
680	4,202,348
689	4,202,349
690	4,202,350
696	4,202,351
719	4,202,352
724	4,202,353
731	4,202,354
774	4,202,355

CLASS 131

10.9	4,202,356
140 R	4,202,357
187	4,202,358

CLASS 132

5	4,202,359
40	4,202,360
123	4,202,361

CLASS 133

4 A	4,202,362

CLASS 134

2	4,202,703

CLASS 135

	4,202,363

CLASS 136

89 CL	4,202,704

CLASS 137

13	4,202,364
72	4,202,365
172	4,202,366
187	4,202,367
498	4,202,368
508	4,202,369
585	4,202,370
604	4,202,371
615	4,202,372
625.29	4,202,373
827	4,202,374

CLASS 138

39	4,202,375
89	4,202,376
94	4,202,377
96 R	4,202,378
99	4,202,379

CLASS 139

368	4,202,380
383 A	4,202,382
383 R	4,202,381
436	4,202,383

CLASS 140

123.6	4,202,384

CLASS 141

59	4,202,385
300	4,202,386
360	4,202,387

CLASS 144

323	4,202,388

CLASS 148

6.11	4,202,705
6.17	4,202,706
9 R	4,202,707
11.5 C	4,202,708
11.5 Q	4,202,709
16.5	4,202,710
111	4,202,711

CLASS 149

22	4,202,712
100	4,202,713
109.4	4,202,714

CLASS 150

52 R	4,202,389

CLASS 151

41.75	4,202,390

CLASS 152

209 D	4,202,391
330 L	4,202,392
330 RF	4,202,393
361 R	4,202,394

CLASS 156

71	4,202,715
79	4,202,716

136 4,202,717
171 4,202,718
205 4,202,719
353 4,202,720
358 4,202,721
436 4,202,722
470 4,202,723

CLASS 160

84 R 4,202,395
107 4,202,396

CLASS 162

272 4,202,724

CLASS 164

82 4,202,397
150 4,202,398
203 4,202,399
251 4,202,400
252 4,202,401
263 4,202,402
409 4,202,403
423 4,202,404

CLASS 165

47 4,202,406
76 4,202,407
109 4,202,408
110 4,202,405
122 4,202,409

CLASS 166

88 4,202,410
244 C 4,202,411
256 4,202,412
292 4,202,413

CLASS 172

42 4,202,414
125 4,202,415

CLASS 174

31 R 4,202,998
50.61 4,202,999
92 4,203,000
135 4,203,004

CLASS 175

94 4,202,416
320 4,202,417
361 4,202,418
374 4,202,419
395 4,202,420
410 4,202,421

CLASS 176

5 4,202,725
18 4,202,726
30 4,202,727
4,202,728
4,202,729
37 4,202,730
4,202,731
4,202,732

CLASS 178

3 4,203,001

CLASS 179

1 CN 4,203,005
2 C 4,203,006
6 E 4,203,007
16 AA 4,203,009
82 4,203,010
99 M 4,203,011
170 NC 4,203,012

CLASS 180

6.48 4,202,422
8 D 4,202,423
176 4,202,424

CLASS 181

120 4,202,425
257 4,202,426

CLASS 182

2 4,202,427
22 4,202,428

CLASS 188

71.1 4,202,429
171 4,202,430

CLASS 192

3.29 4,202,431
107 M 4,202,432
129 A 4,202,433

CLASS 198

316 4,202,434
339 4,202,435
472 4,202,436
497 4,202,437
524 4,202,438
642 4,202,439
718 4,202,440
779 4,202,441
820 4,202,442
831 4,202,443

CLASS 200

5 A 4,203,013
38 R 4,203,014
42 T Re.30,273
61.45 R 4,203,015
159 R 4,203,016
339 4,203,017

CLASS 201

1 4,202,733
6 4,202,734
41 4,202,735

CLASS 203

10 4,202,736

CLASS 204

95 4,202,738
98 4,202,743
129 4,202,744
129.35 4,202,739
130 4,202,740
158 R 4,202,741
159.23 4,202,742
180 R 4,202,745
181 C 4,202,746
195 G 4,202,749
195 R 4,202,747
4,202,748
197 4,202,750
4,202,751
222 4,202,752
247 4,202,753
272 4,202,754

CLASS 206

37 4,202,445
147 4,202,446
389 4,202,447
392 4,202,448
453 4,202,449
459 4,202,450
526 4,202,451

CLASS 208

5 4,202,755
8 LE 4,202,756
10 4,202,757
143 4,202,758

CLASS 209

17 4,202,761
234 4,202,759

CLASS 210

3 4,202,762
14 4,202,763
22 A 4,202,760
22 D 4,202,764
31 R 4,202,765
32 4,202,737
40 4,202,766
44 4,202,767
62 4,202,768
83 4,202,769
96.1 4,202,770
130 4,202,771
232 4,202,772
256 4,202,773
274 4,202,774
287 4,202,775
321 B 4,202,776
405 4,202,777
522 4,202,778

CLASS 211

41 4,202,452

CLASS 212

55 4,202,453

CLASS 213

86 4,202,454

CLASS 215

31 4,202,455
228 4,202,456

CLASS 219

69 V 4,203,018
72 4,203,019
93 4,203,020
121 EB 4,203,021
4,203,023
121 P 4,203,022
146.1 4,203,024
216 4,203,025
222 4,203,026
275 4,203,027
384 4,203,028

CLASS 220

3.3 4,202,457
85 B 4,202,458
90.4 4,202,459
218 4,202,460
268 4,202,461
293 4,202,462
307 4,202,463
339 4,202,464
468 4,202,465

CLASS 221

93 4,202,468

CLASS 222

1 4,202,466
20 4,202,467
91 4,202,469
130 4,202,470
153 4,202,471
187 4,202,472
598 4,202,473
609 4,202,474

CLASS 225

2 4,202,475

CLASS 226

119 4,202,476
4,202,478

CLASS 227

8 4,202,479
4,202,480
145 4,202,481

CLASS 228

4.5 4,202,482
43 4,202,483
173 A 4,202,484

CLASS 229

22 4,202,485

CLASS 232

35 4,202,486

CLASS 233

1 A 4,202,487
24 4,202,488

CLASS 235

92 CC 4,203,030
92 PC 4,203,029
101 4,202,489
449 4,202,490
491 4,202,491

CLASS 236

49 4,202,492

CLASS 237

2 B 4,202,493

CLASS 238

83 4,202,494

CLASS 239

1 4,202,495
14 4,202,496
112 4,202,497
156 4,202,498
177 4,202,596
206 4,202,499
533.3 4,202,500
570 4,202,501

CLASS 241

82.5 4,202,502
194 4,202,503
4,202,504
247 4,202,505

CLASS 242

36 4,202,506
46.2 4,202,507
84.2 G 4,202,508
86.5 R 4,202,509
107.4 R 4,202,510
150 R 4,202,511
157.1 4,202,512
189 4,202,513

CLASS 244

3.11 4,202,515
3.15 4,202,516
3.22 4,202,517
12.1 4,202,518
214 4,202,519

CLASS 248

68 CB 4,202,520
98 4,202,521

CLASS 249

102 4,202,522
115 4,202,523

CLASS 250

201 4,203,031
205 4,203,032
252 4,203,033
280 4,203,034
363 S 4,203,035
445 T 4,203,036
505 4,203,037
507 4,203,038

CLASS 251

28 4,202,524
40 4,202,525
51 4,202,526
58 4,202,527

CLASS 252

8.1 4,202,779
12 4,202,780
32.7 HC 4,202,781
51.5 A 4,202,782
4,202,783
51.5 R 4,202,784
102 4,202,786
171 4,202,787
182 4,202,788
182.1 4,202,789
186 4,202,790
299 4,202,791
301.1 S 4,202,793
301.1 W 4,202,792
301.4 R 4,202,794
332 4,202,795
389 A 4,202,796
413 4,202,797
437 4,202,798
500 4,202,799
543 4,202,800

CLASS 254

86 R 4,202,528
89 H 4,202,529
93 H 4,202,514
134.3 FT 4,202,530
134.4 4,202,531

CLASS 256

24 4,202,532

CLASS 260

5 4,202,801
8 4,202,802
17.4 BB 4,202,803
17.4 R 4,202,804
22 CB 4,202,805
23 XA 4,202,806
29.1 SB 4,202,807
29.6 WB 4,202,808
29.7 S 4,202,809
31.2 N 4,202,810
37 R 4,202,813
37 SB 4,202,811
4,202,812
40 P 4,202,814
42.21 4,202,815
45.75 N 4,202,816
239.1 4,202,817
245.3 4,202,819
315 4,202,820
326.5 S 4,202,821
340.9 P 4,202,822
343.6 4,202,823
343.9 4,202,824
345.2 4,202,825
346.75 4,202,826
378 4,202,827
396 R 4,202,828
397.2 4,202,829
429.7 4,202,830
438.1 4,202,840
455 A 4,202,832
463 4,202,833
465 D 4,202,834
465 F 4,202,835
465.4 4,202,836
465.9 4,202,837
505 C 4,202,838
569 4,202,839
928 4,202,842
985 4,202,843
4,202,844

CLASS 261

142 4,202,846
161 4,202,847

CLASS 264

0.5 4,202,849
1 4,202,848
108 4,202,850
113 4,202,851
115 4,202,852
138 4,202,853
168 4,202,854
210.2 4,202,855
221 4,202,856
333 4,202,857

CLASS 266

45 4,202,533
56 4,202,535
135 4,202,536
172 4,202,534
252 4,202,537
275 4,202,538

CLASS 269

70 4,202,539
166 4,202,540

CLASS 271

132 4,202,541
276 4,202,542

CLASS 272

3 4,202,543

CLASS 273

73 R 4,202,544
87 R 4,202,545
93 R 4,202,546
181 A 4,202,547
272 4,202,548

CLASS 274

9 RA 4,202,549
23 R 4,202,550
39 R 4,202,551

CLASS 277

26 4,202,552
41 4,202,553
53 4,202,554
153 4,202,555
190 4,202,556

CLASS 279

19.5 4,202,557

CLASS 280

11.28 4,202,558
87.04 R 4,202,559
96.3 4,202,560
278 4,202,561
415 R 4,202,562
675 4,202,563
678 4,202,564
756 4,202,565

CLASS 282

27.5 4,202,566

CLASS 285

18 4,202,567
336 4,202,568

CLASS 289

18.1 4,202,569

CLASS 292

60 4,202,570
216 4,202,571
217 4,202,572
223 4,202,573
228 4,202,574
347 4,202,575

CLASS 294

83 R 4,202,576

CLASS 296

24 R 4,202,577
37.16 4,202,578
156 4,202,579

CLASS 297

84 4,202,580
440 4,202,581

CLASS 301

37 SA 4,202,582

CLASS 303

22 R 4,202,583
105 4,202,584

CLASS 307

10 R 4,203,039
65 4,203,040
67 4,203,041
241 4,203,042
252 C 4,203,047
254 4,203,043

CLASS 308

181 4,203,074

CLASS 310

61 4,203,044
68 C 4,203,045
93 4,203,046
268 4,203,048

CLASS 312

15 4,202,585
107 4,202,586
219 4,202,587

CLASS 313

174 4,203,049
220 4,203,050

CLASS 315

13 C 4,203,051
209 CD 4,203,052
254 4,203,053
368 4,203,054
375 4,203,055
389 4,203,056

CLASS 318

285 4,203,057
380 4,203,058
446 4,203,059
474 4,203,060
490 4,203,061
571 4,203,062
603 4,203,063
640 4,203,064

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CLASS 337

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49 : 4,202,052
4,202,135
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51 : 4,202,129
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53 : 4,202,061
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55 : 4,202,071
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56 : 4,202,145
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4,202,635
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06 : 254,944
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254,971
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254,980
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254,988
254,994
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09 : 254,947
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12 : 254,940
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17 : 254,977
18 : 254,957
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21 : 254,975
22 : 254,942

23 : 254,956
25 : 254,976
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32 : 254,968
34 : 254,937
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36 : 254,961
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254,963
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254,982

254,984
254,992
37 : 254,989
39 : 254,960
41 : 254,936
44 : 254,955
45 : 254,966

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36 : 4,535
39 : 4,534

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